Cape Peninsula
University of Technology

An Evaluation of Contemporary Leadership in Industry 4.0: A Survey of IT Project Management Practitioners in the Gauteng Province

by

EDUAN DU TOIT

Dissertation submitted in fulfilment of the requirements for the degree

Master of Technology: Business Administration in Project Management

in the

FACULTY OF BUSINESS MANAGEMENT

at the

CAPE PENINSULA UNIVERSITY OF TECHNOLOGY

Supervisor: Irshaad Desai
District Six Campus
November 2020

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_____E P Du Toit_____   _19 June 2024_____

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ABSTRACT

Technological advancements that bridge the physical and biological worlds have resulted from the fourth industrial revolution (4IR), radically altering entire sectors, pushing the boundaries and opening up new avenues for business. Therefore, 4IR is becoming a more relevant subject in project management. Social inclusion and economic development are aided significantly by information technology (IT). Project management practitioners should re-evaluate their approach to project management considering the gradual but steady advancements in digital technology and innovation.

To benefit fully from 4IR, project managers should adopt a strong leadership style that is different from the traditional controlling role. Project delivery is impacted by an organisation's leadership quality. Situation-based leadership approaches are required, considering the revolution in technology and the millennial generation. The important role that leadership plays and contributes to project management is examined in this study.

This study examines the increasing significance of 4IR in adding value to projects by closely examining the methods that project managers can use to encourage agility in projects. This study aimed to investigate how project managers can improve their leadership skills to handle 4IR and digital transformation, using the quantitative paradigm. The managers in Gauteng province IT industry, including first-line, middle- and top managers, were the target population of the study. The researcher used a convenience sampling strategy, which involved gathering samples from a group of people who were readily available or contactable.

The sample size in this study was 150 participants. To gather consistent data from a sizeable population, the study made use of semi-structured questionnaires. The researcher entered the data from the semi-structured questionnaire into a separate spreadsheet and cross-referenced it with the data from the SPSS 27 spreadsheet to ensure accuracy. Before using regression analysis to further analyse the data, descriptive

statistics for each variable, such as frequency, means and standard deviations, were applied.

Keywords: Fourth industrial revolution (4IR), Industry 4.0, Leadership, Project managers in IT

ACKNOWLEDGEMENTS

DEDICATION

This dissertation is dedicated to my late father, P.C. du Toit, my mother Ilne du Toit, my loving wife Suzanne du Toit, as well as to my children, Liya, Zion, Elisha and Jessie.

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GLOSSARY

Industrial Revolution: The term "revolution" conjures up a quick change. Since the advent of new technologies and innovative worldviews throughout history, traditional economic systems and social structures have experienced substantial transformations (Schwab, 2016:11).

Industry 4.0: An advanced phase of the industrial revolution referred to as "Industry 4.0" is characterised by a focus on automation, real-time data, connectivity, and machine learning (Schwab, 2016).

Leadership: The term "leadership" is used broadly to describe the personality characteristics and actions of people who have the power, influence and responsibility to guide groups (Hartzell, 2006).

Project Management: The process of conducting project activities and fulfilling project requirements while using knowledge, skills, tools and methodologies is known as project management (PMI, 2017:5).

CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1 Introduction

The fourth industrial revolution (4IR), which has an impact on many industries, is now contentious due to the state of the global economy. The study will use Schwab's (2016:7) definition of 4IR, which characterises it as the most recent and unmatched developments in robotics, nanotechnology, artificial intelligence (AI) and the Internet of Things (IoT). The advent of 4IR has led to the development of technologies that span the biological and physical worlds, completely reimagining entire industries, changing established boundaries and creating new opportunities. Bolick (2019) asserts that the reinterpretation of conventional managerial practices brought about by the new 4IR era has led to a digital transformation in various industries. Thus, 4IR is also becoming a more pertinent topic in project management.

Information technology (IT) has been recognised by the South African Minister of Telecommunications and Postal Services as a key facilitator of social inclusion and economic development. According to Kneale (2017), the gross domestic product (GDP) of the IT sector is between 1% and 6% of the national GDP. The National Integrated Information and Communications Technology (ICT) Policy White Paper (2016), SA Connect as well as digital migration, in contrast, are seen by many investors as stifling the sector's growth. So, 4IR is essential to project management because it has revolutionised interpersonal and professional interactions in the current technological era.

According to recent studies, digital transformation and new technologies should be embraced by South African industries. With its ability to connect billions of people and objects seamlessly through state-of-the-art technologies, 4IR is the newest trend in the IT industry. Baller et al. (2016) assert that the 4IR has unleashed pressures for innovation and competition that necessitate ongoing innovation from both tech and non-tech companies. Business analysts believe that 4IR has produced a highly competitive environment that is rapidly changing, and Kneale (2017) echoes this belief. The IT

industry should take action to maintain its competitive advantage considering these changes.

Given the slow but steady advances in digital technology and innovation, project management professionals should reconsider how they manage projects. To reap the rewards of 4IR fully, a strong leadership style that differs from the traditional controlling role is required within the project environment. The quality of leadership in an organisation impacts project delivery (Emmanuel, 2011:23). Therefore, South African enterprises should enhance their research output to generate quality information about the critical role and contribution of leadership in project management. The 4IR era, which is characterised by disruptive technology, requires project managers to focus on learning how to lead projects successfully in this environment.

1.2 Background of the study

1.2.1 Industrial revolution

The word "revolution" conjures up a quick change. Traditional economic systems and social structures have undergone significant changes because of the introduction of new technologies and creative perspectives on the world throughout history (Schwab, 2016:11). Steam, electricity, computing and intelligence were all innovations that came before 4IR.

INDUSTRIAL REVOLUTION
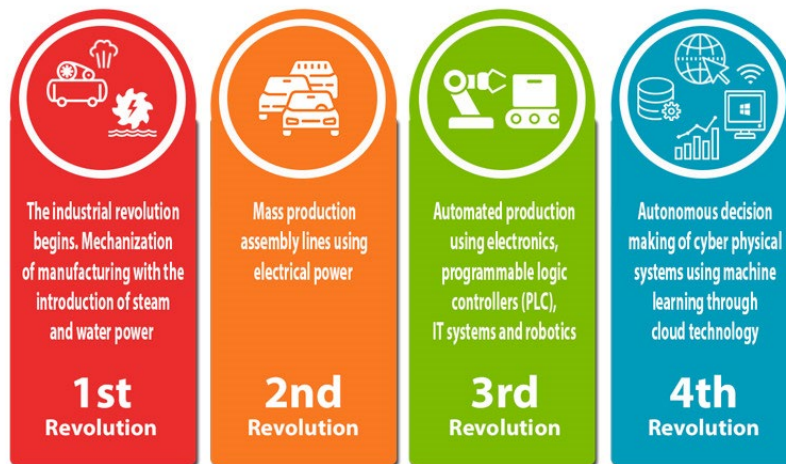
Figure 1.1: Industrial revolutions
Source: Study Malaysia (2020)

1.2.1.1 The first industrial revolution

Mpofu and Nicolaides (2019:3) assert that the 19th century saw the start of the first industrial revolution. Water and the steam engine were the two primary drivers of the first industrial revolution. Rifkin (2012) stated that the earliest of these novelty items was produced in the 1760s in Great Britain, and it extended swiftly to the US and the rest of Europe.

(1987:213) asserts that the first industrial revolution accelerated the transition from an agrarian to an industrial society by having a substantial impact on primarily agricultural and feudal communities. Railways, steam engines and mechanical production all grew out of the revolution (Davis, 2018). According to Xing and Marwala (2018:11), most researchers concur that, instead of using people and animals to power machines, they used steam and water.

1.2.1.2 The second industrial revolution

The second industrial revolution, or 2IR, began in the 1950s. Significant technologies have emerged as a result of these shifts, including mass production, electricity, telephones, aeroplanes, cars and combustion engines (Davis, 2018; Rifkin, 2012). The

development of technology was spearheaded by Germany and the US. The ship and railway industries now include major industrial companies, such as Bayer AG, General Electric, Standard Oil and US Steel (Marwala & Hurwitz, 2017:3). According to Schwab (2016:11), the scientific and technological advancements of the second industrial revolution sped up industrialisation using electricity and oil to power mass production and mechanise manufacturing. Processes for mass production were made possible using electrical energy.

Because of mass production, electricity, and the assembly line, people thought progress was unavoidable and that science and technology were the key to achieving a higher standard of living (Schwab, 2016:43). It was believed that the second industrial revolution represented a significant advance in both technology and society. These innovations were based primarily on science and focused on electricity, chemicals, railways and precious metals, such as iron and steel. Public automobiles and aeroplanes first appeared because of the development of steel, petroleum and electricity (Atkeson & Kehoe, 2007:8). During this period of expansion, well-established industries such as the steel, oil and electric sectors expanded, leading to an increase in aircraft and public transportation.

1.2.1.3 The third industrial revolution

The 1950s marked the beginning of the third industrial revolution, also known as the information revolution. According to Subban and Jarbandhan (2019), the internet, IT and electronics were all invented during this industrial revolution. It was spurred by the development of electronic devices and the internet. Apple, Facebook, Google and other internet technology companies have grown rapidly, which has contributed to the democratisation of knowledge. According to Schwab (2016), the term "computer or digital revolution" describes the third industrial revolution that was fuelled by semiconductors, mainframe computers, personal computers and the internet. The mainframe and semiconductor industries grew rapidly, which set off the third industrial revolution, also known as the computer or digital revolution. The shift to a world powered by clean energy is one of the three pillars of the third industrial revolution (Rifkin, 2012).

1.2.1.4 The fourth industrial revolution

According to Baller, Dutta and Lanvin (2016), the start of the fourth industrial revolution will change how we live and work. It is anticipated that it will change how we interact with one another and with our surroundings. 4IR poses a risk of upsetting how societies function (Schwab, 2016). Global political and economic systems are being changed by the fourth industrial revolution. It has forced leaders and decision-makers to move quickly (Schwab, 2016:13). Marnewick, Erasmus and Joseph (2017:1) have emphasised the significance of speed and agility in implementing the fourth industrial revolution. Both positive and negative effects of the 4IR transformation will be felt globally across various industries. The most important elements enabling people to have a positive impact on their communities and families are identified using the 4IR process (Schwab, 2016:49). The growth of the information society has been aided by 4IR technologies, which promise to change how we live as the age of abundance arrives (Subban & Jarbandhan, 2019).

Pereira and Romero (2017:1212) predict that 4IR will impact several sectors of the economy and working conditions. These two experts predict that, over the coming decades, 4IR will produce unforeseen growth and productivity rates. Other researchers have discovered that the innovative technologies of 4IR will fundamentally alter both conventional business procedures and interpersonal relationships in the public and private sector (Xing & Marwala, 2018). The distinctions between the physical, biological and digital domains are becoming increasingly blurred as technology advances (Schwab, 2016).

Xing and Marwala (2018:11) assert that 4IR technologies have been used in many fields, including advanced robotics and AI. To create an adaptable yet vast production and service network, Hallward-Driemeier and Nayyar (2017) posit the concept of 4IR digitalised industrial processes. The use of 4IR technologies will enable automated machines to network and exchange information through technological advancements without requiring human interaction, thus increasing efficiency (Alaloul et al., 2019:227). Technologies are seen as a means of delivering innovations in the current industrial revolution (Deloitte, 2017:4), evolving exponentially rather than linearly. This revolution

could impact how we work, provide services, educate and enjoy ourselves (Alaloul et al., 2019).

Despite the enthusiasm surrounding 4IR technologies, concerns have been raised about how they will affect the labour market. The issue of technological advancement replacing human labour with machine labour is one that raises shared concerns (Mokyr, Vickers & Ziebarth, 2015:32). Inequality and technological unemployment may rise because of this decision. The workforce will most likely be uneasy and agitated at the prospect of being replaced by robots, mechanical systems and learning technologies, which will make it more difficult for many workers to find work.

Digital technologies are anticipated to make a significant contribution in the US and the United Kingdom (UK), which will also result in layoffs as the trend will influence the decisions made by employees (Mpofu & Nicolaides, 2019:5). Dilberoglu et al. (2017:546) predict that, as industries are distributed across different regions, there will be a striking redefinition of the roles of employees and customers. The McKinsey Global Institute (2017) notes that people have long been concerned about automation because they believe that changes in the workplace will impact employment. According to Schwab (2016), the way different technologies are interacting and fusing makes the fourth industrial revolution unique from the others. Every revolution is disruptive, but the fourth industrial revolution is distinct because it has the ability to birth new sectors of the economy. Modern technologies should be used to connect people and reduce the effects of previous revolutions (Marr, 2016).

1.2.2 The information technology (IT) industry

The global IT industry was expected to reach an astounding $7.6 trillion by the end of 2024, according to studies by IDC. According to a CompTIA report (2019:16), the IT industry made a significant contribution to economies across the board because of various trends. Technology is advancing at a positive rate because of the IT industry's innovation waves. There are various ways to categorise the information technology industry: software, hardware, services, telecom services and emerging technologies comprise the five traditional taxonomies that can be used to categorise the IT industry

(CompTIA, 2016:19). Figure 1.2 displays the different categories for the information technology sector.

Figure 1.2 Key Categories of the information technology industry
Source: IDC (2019)

Over 3,000 electronic companies and over 13,000 businesses in the IT sector are believed to exist in South Africa. Most of these businesses have fewer than 50 employees (Globe Newswire, 2019). Numerous companies in the IT sector were created through mergers and acquisitions. The South African IT industry has been taunted by several technologies, which has increased software markets. Online shopping, mobile banking, virtual reality and block chain are some examples of technologies intended to enhance customer experience (Globe Newswire, 2019). The market for packaged software grew significantly in 2017, rising by an impressive 10% and is predicted to reach R36.8 billion by 2021, according to a Business Tech (2018) article.

1.2.3 Project management in 4IR

The discipline that has the biggest impact on a project's outcome is project management. Project management is the process of organising and supervising work to complete tasks to meet project objectives (PMI, 2017:5). Projects are typically executed more effectively

and efficiently in organisations that apply project management processes correctly. Projects are a common tool used by organisations to generate value and benefits. Project management professionals should adapt to the significant changes brought about by 4IR. Project managers are now required to take on responsibilities outside their traditional purview to deliver projects one after the other. Win and Kham (2018) recommend adapting conventional project management strategies in the 4IR era to handle job variations. PMI (2017:6) asserts that, for organisations to keep up with changes in technology and project management trends, they should adopt agile scrum methodologies. Organisations are shifting to an integrated approach to project management to stay competitive and meet goals pertaining to the different facets of the fourth industrial revolution.

As project management techniques continue to advance, the workplace will change and the integration of 4IR components will be supported (Win & Kham, 2018). For a project to be delivered successfully, advanced soft and hard skills and a high level of autonomy are required. Because people will be able to communicate using cutting-edge technologies, such as virtual conferencing, project teams will increasingly work remotely. Therefore, project managers should be able to collaborate with team members from various cultural backgrounds. Artificial intelligence, for example, and other recent technological advancements will have a significant impact on project management (Lahmann, Keiser & Stierli, 2018). Win and Kham's (2018) studies highlight the unique impacts of AI on task distribution and predictive project analytics, recommendations and actions. The project management industry has changed because of technological developments. The way the project manager handles documents and interacts with the project team has been significantly impacted by social collaboration tools. Modern technology has been adopted by the industry to share updates, documents and other important information with their project teams.

Project teams and stakeholders can now communicate effectively even when they are working remotely because of these technologies. The use of collaboration tools has significantly increased, enabling stakeholders and project teams to work together and to achieve project goals.

1.2.4 Leadership

1.2.4.1 Leadership in perspective

Generally, the word "leadership" refers to the personality characteristics and actions of people who have the power, influence and responsibility to guide groups (Hartzell, 2006). According to Northouse (2010), leadership is the art of persuading a group of individuals to collaborate towards a common objective. To influence the individuals working on the project, leadership requires getting to know the surroundings and making adjustments to them. Numerous studies on leadership abilities, proclivities, traits, or styles have been conducted. The success of any endeavour depends on effective leadership. The standard of a project's leadership techniques determines its success (Emmanuel, 2011:25). Every project or organisational goal can be more easily attained when there is a leader who can convince the participants to put forward their best effort (Abbas, 2014:53). It is becoming more evident that strong leadership is necessary for third-world nations to experience economic growth in the future (Schwab, 2016).

Because projects are planned and carried out by people, a key component of their success is the leadership style used. According to the analysis of Haleem et al. (2008), managers who foster a more positive work environment tend to see a decrease in employee turnover. Workers can effectively contribute to achieving these goals in a supportive environment. Benator and Thumann (2003) draw attention to the challenges faced by contemporary leaders who employ various leadership theories and styles. The proliferation of leadership theories has led to confusion among leaders trying to make sense of the often-conflicting leadership styles in the workplace. Individuals are willing to adopt different leadership and management ideologies. Leaders are in charge of inspiring followers and ensuring that all procedures and systems function to achieve the same objective. Some leadership philosophies exaggerate the feeling of helplessness among project teams and can have a damaging effect on motivation and self-efficacy.

1.2.4.2 Contemporary leadership styles

Three leadership philosophies that are effective in most situations dominate the modern literature dialogue (Du Plessis, 2014:72). These leadership philosophies are transformational, transactional, authentic and servant.

1.2.4.2.1 Transformational leadership

When someone makes a transformational change, they start placing the organisation's goals above their own. In addition, this describes how adaptable the organisation is because of its increased motivation and oriented alignment (Jackson, 2020:156). Aligning their own and their followers' goals is what drives transformational leadership (Jackson, 2020). Transformative leadership and a project team's willingness to go above and beyond are strongly correlated (Davis, 2018). The fundamental components of transformational leadership include idealised influence, motivating inspiration, intellectual stimulation, and consideration of each person's needs and circumstances (Jackson, 2020). Table 1.1 lists the four requisites for transformational leadership.

Table 1.1: The four I's of transformational leadership

Inspirational motivation	The ability to inspire followers, increase motivation, boost effort, and provide meaning and optimism about the vision and its attainability (Bass, 1985b). The transformational leader sets high performance expectations and rewards behaviours that are directed toward fulfilling the vision. Martin Luther King, Jr. "I have a dream" speech is a good example of inspirational motivation.
Idealised influence	The transformational leader is held in high esteem and idealised. He or she role models behaviours that followers strive to imitate and sets the standards for the rest of the organisation to emulate (Spoelstra, 2009).
Intellectual stimulation	Transformational leaders encourage followers to question the status quo, and stimulate followers to consider problems from imaginative perspectives.
Individualised consideration	Transformational leaders recognise their followers' potential and help them to reach their full potential by providing them with tasks and opportunities to grow and develop their abilities, whilst still attending to pressing needs and/or the organisation (Spoelstra, 2009).

Source: Du Plessis (2013:73)

One essential characteristic of transformational leadership is the capacity to engage followers in securing commitment to organisational goals. Spoelta (2009:2) asserts that the concept of transformational leadership inspires managers to take on leadership roles.

1.2.4.2.2 Transactional leadership

Transactional leadership places greater emphasis on the concepts of hierarchy and position than transformational leadership (Van Eeden, Cilliers & Van Deventer, 2008). Reciprocity is the foundation of transactional leadership; it is the process by which leaders and followers build relationships by exchanging rewards (Du Plessis, 2014:358). As long as their staff members are on board, transactional leaders put more emphasis on defining the team's goals and objectives.

1.2.4.2.3 Authentic leadership

Gardner et al. (2011) contend that the most important requirements for becoming a leader are learning to accept who you are and becoming highly self-aware. An authentic leader is non-defensive, which enables them to remain impartial and constant in all circumstances and open with their followers about their motivations (Luthans & Avolio, 2003). Authentic leaders can foster trust because they are self-aware, open to sharing information and able to express their true feelings (May et al., 2003). Authentic leaders can lead with a purpose because they are aware of what their lives and leadership are all about (May et al., 2003). They overcome their egotistic desire to rule everything and concentrate on empowering others through a common goal (Leroy et al., 2015). Authentic leaders resist pressure from their groups, organisations, and society in favour of acting and making decisions in accordance with internal moral and ethical standards (Gardner et al., 2011).

1.2.4.2.4 Servant leadership

Servant leadership is an employee-centred style of leadership that gives subordinates the freedom to decide for themselves and maintain control over their work. Servant leadership is selfless leadership that puts the needs of others ahead of one's own by fostering their professional and emotional development (Muzira, Muzira & Min, 2020:24). The goal of servant leadership is to enable subordinates to take on leadership roles in achieving the objectives of the organisation. This style of leadership sees the leader as a servant and steward of the team members and organisation. Rather than having followers assist managers in carrying out their duties, the emphasis should be more on assisting followers in doing their own tasks (Greenleaf, 1977). To practise servant leadership, leaders and

followers should have a relationship in which the former does not dominate or control the latter. To accomplish organisational objectives, followers and leaders collaborate in a supportive environment.

Figure 1.3: Qualities of an authentic leader
Source: Du Plessis (2013:74)

1.2.5 Leadership in 4IR

The 4IR will bring about significant changes to the soft skills of project practitioners owing to the increased communication channels with project stakeholders. This new environment calls for modern leadership styles and management strategies (Wilen, 2018). Organisations are being forced to diversify and become more technical because of emerging and advancing technologies and competition. According to Schwertner (2017), organisations that are eager to succeed need outstanding leadership which is willing to accept quick changes in technology and business models. A combination of new factors and established leadership abilities should coexist. Research by the Global Centre for Digital Business Transformation (2022) shows that certain leadership traits are particularly crucial in disrupted business environments. While 92% of executives are cognisant of the elements contributing to digital disruption, less than 15% of them are equipped to steer their companies through this unparalleled digital tempest (Bendig,

Wagner, Piening & Foege, 2023). Those in charge should stay current with the ongoing global revolution.

1.2.6 Problem statement

As mentioned before, 4IR is projected to cause dramatic changes in the way projects are handled and performed. As in earlier industrial revolutions, leadership lags result in a technological slowdown (Oosthuizen, 2016). Seen from the perspective of significant technological advancements, existing businesses will be disrupted. Gradual developments in digital technology and innovation require a shift in project management practices. To use 4IR properly, project managers should adopt various leadership styles. Projects in the 4IR period need self-organised teams to complete work, but this leaves the leadership role as the effective execution of the project. The millennial generation and dramatic technological advances require situation-based leadership techniques. To manage and lead projects in a rapidly evolving technological environment, project management practitioners in the IT sector need appropriate leadership styles and traits. However, this gap in the literature has not been filled. Through a careful examination of the techniques that project managers can employ to promote agility in projects, this study explores the growing role of 4IR in providing value to projects. It is feasible to conduct a critical analysis of how project management practitioners can enhance their leadership skills to manage 4IR and digital transformation by identifying leadership strategies that support alternative modern uses of technology to change systems and behaviour.

1.2.7 Research objectives

These are the study objectives set by the researcher. They are derived from and related to the problem statement. Research objectives can be classified into two categories: primary and secondary.

1.2.8 Aim

- This study aims to investigate how project management professionals can develop their leadership abilities to deal with 4IR and digital transformation.

1.2.9 Objectives

- To investigate the evolving role of 4IR in project value delivery.
- To examine how project managers can foster agility in projects.
- To identify leadership strategies that encourage innovative uses of technology to alter behaviour and systems in the management of projects.

1.3 Research questions

Research questions serve as a roadmap for selecting relevant literature to review, but their significance comes from the fact that they address the problem statement. The two categories of research questions are primary and supporting research questions.

1.3.1 Main – Primary research question

How can project management professionals develop their leadership abilities to deal with 4IR and digital transformation.

1.3.2 Sub-research questions

- What new role does 4IR play in project value delivery?
- How can project managers encourage agility in their projects?

  Which leadership styles are most effective in promoting innovative uses of technology to alter behaviour and systems in the management of projects?

1.4 Research or conceptual framework

The existing literature on leadership emphasises the importance of contingency leadership (Müller, Konzag, Nielsen & Sandholt, 2024) suggesting that the leader needs to lead within the context of the organisational culture, the tasks to be performed and the people performing the tasks. Below is a conceptual framework based on literature on leadership and the type of power a leader may have and the personality traits involved in the process.
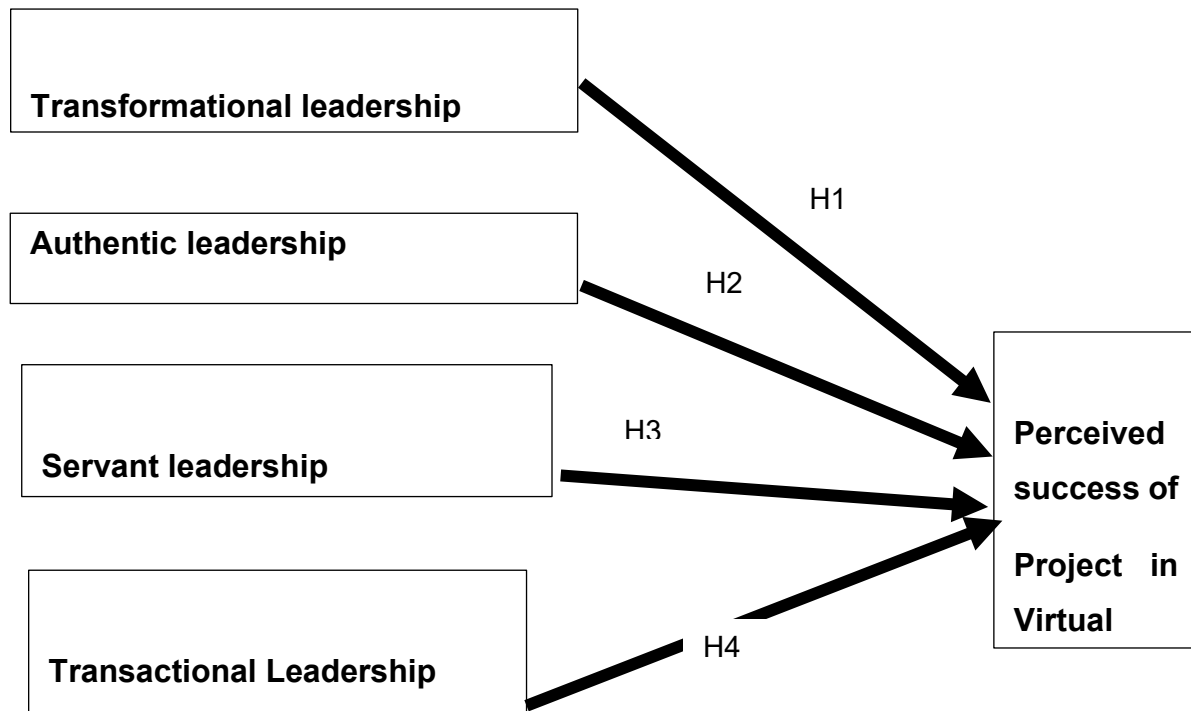
Figure 1.4: A conceptual model of the leadership styles that impact virtual project teams' perceived success

Source: Own construction

The conceptual framework used to complete this study is depicted in Figure 1.4. This is based on a theoretical model that Park and Popescu (2014) reviewed and developed. This study explores the effects of different leadership philosophies on 4IR projects involving virtual teams. It is a follow-up to Park and Popescu's (2014) investigation into the relationship between perceived project success and leadership behaviour. On the right side of this framework, the dependent variable is the perceived success of projects completed by virtual teams, and on the left, the independent variables are transformational, transactional, authentic and servant leadership philosophies. A conceptual framework was created to show how the dependent and independent variables should be related.

1.5 Rationale and significance of the study

Project management is becoming more critical as Industry 4.0 technology develops. However, technology and digitalisation require leadership style transformation (Abella-

Zata, 2018). Conventional leadership practices are insufficient to ensure project success. This study evaluates the importance of leadership in a rapidly changing technological world. The study will be conducted by surveying IT project management practitioners participating in projects in Gauteng province. This study is vital to the project manager, who should know whether Leadership 4.0 leads to an anticipated positive effect on project management practices. The study will be important for organisations that seek to achieve their goals using Leadership 4.0 knowledge, skills, tools and methodologies. Research on how technology affects leadership and project management is still lacking. Therefore, the body of knowledge in that field is enriched by this study, as essential to the organisation's project management practices, which have moderating impacts on Industry 4.0 technology in terms of its impact on project management success. This research is vital for project coordinators to establish virtual organisations where various project disciplines may connect using cloud computing platforms without physically meeting. Using virtual organisations helps project managers and stakeholders to avoid communication problems that may harm a project's success.

Thus, this study will justify the relevance of leadership regarding effectively implementing 4IR technologies that will enable the success of projects. This study will benefit project partners who will be able to interact in real-time through cloud computing platforms throughout the manufacturing process. More importantly, the government will also benefit from increased national production because of leaders using Industry 4.0 technologies in executing successful projects in manufacturing, tourism, agriculture, construction and other industries. A project's perceived success is anticipated to be positively impacted by a blend of transformational, transactional, authentic and servant leadership styles.

1.6 Methods and materials of study

1.6.1 Research philosophy

A set of guidelines for gathering and assessing knowledge or data is referred to as research philosophy (Ryan, 2018). Research philosophies include pragmatism, positivism, realism and interpretivism (Johnson, Russo & Schoonenboom, 2019). Realism mimics real-life situations and portrays the human condition. According to

positivists, science is the only valid source of knowledge. According to interpretivism, no one way of thinking can be regarded as inherently true or right. The truth may be both consistent and inconsistent among observers, according to pragmatic researchers. Ryan (2019) argues that positivism is still relevant today because it generates reliable results with a sizable sample size. Quantitative research is most compatible with the positivist paradigm because it offers facts through science and logic (Johnson et al., 2019). The positivist paradigm is also appropriate (for project success and leadership) because the study's goal is to describe variables and relationships. It is also appropriate because it seeks to predict outcomes, test hypotheses and assess the strength of relationships between variables (Ryan, 2018).

1.6.2 Research approach

The majority of research on the relationship between leadership and specific outcome variables is quantitative, as the literature review points out. Researchers can employ qualitative, quantitative, or mixed methods (Creswell, 2017). In light of the aforementioned, a quantitative research strategy is suggested for conducting this study. The ability of the quantitative research method to pinpoint formally defined cause-and-effect relationships is a notable advantage (Martinez-Mesa, 2016). More interestingly, in research, one can use both inductive and deductive research approaches. Deductive reasoning yields predictable results, whereas inductive reasoning draws broad or theoretical conclusions from the collected data (Asad et al., 2019). A deductive quantitative research methodology will be used in this study to examine the relationship between project success and leadership style. An advantage of the quantitative approach – which is predicated on the deductive approach – is that, unlike the inductive qualitative approach, which is predicated on subjective judgements, it is grounded in measurements, statistics, theory and numbers (Pandey, 2019).

1.6.3 Research design

Creswell (2017) states that a set of instructions makes up the research strategy. Surveys, case studies and action research are examples of quantitative research techniques. The number of cases in a case study can range from one to more, such as an organisation (Saunders, Lewis & Thornhill, 2016). Research that is applied and encourages change is

referred to as "action-oriented research". A survey employs a sample of the population to characterise trends (Wang et al., 2019). Surveys and questionnaires are commonly used in research. Grounded theory, phenomenology and ethnography are additional qualitative research techniques.

Surveys were conducted as part of this investigation. It is acceptable to carry out a survey to discover patterns, beliefs, attitudes, ideas, or opinions. The composition of the population is revealed by the sample results in a survey. A survey's advantage is its extreme efficiency, which enables researchers to gather a lot of data for relatively little money. Data can be gathered using short responses to various questions and respondents can be relied upon to provide truthful answers.

1.6.4 Research methodology

Epistemology, ontology, methodology and axiology make up a research paradigm (Lincoln & Guba, 1985). Data collection, participants, tools used and data analysis are all explained in detail by the methodology. The rationale and guidance for the methodological steps used in research are provided by research methodology. According to the literature review, most studies on leadership are quantitative and frequently examine the leadership qualities and philosophies that are most appropriate for industries. Other researchers, however, used qualitative techniques to enable them to interact closely with the subjects.

The three methods that researchers can use to conduct research are qualitative, quantitative and mixed methods (Teddlie & Tashakkori, 2009). Despite being more intense and interesting, qualitative research only excels in situations where there is little existing knowledge about the phenomenon or when a fresh viewpoint is desired. Researchers concur that integrating qualitative and quantitative methods guarantees that the weaknesses of one approach are offset by the advantages of the other (Creswell, 2017).

This study conducted using the quantitative paradigm considering the context. Quantitative research's ability to pinpoint structured cause and effect relationships is a distinctive quality (Gray, 2018). Quantitative research brings clarity to the objectives under

investigation. Participants need not report to a specific location; therefore, the paradigm also allows the researcher to conduct research from a distance.

1.6.4.1 Population

The population of a study is all possible units or components (Martinez-Mesa, 2016). To create a target population representing a pool of instances to be studied, researchers should decide what will be sampled, how far they will go and where they will do it. To conduct this study, the researcher considered its appropriateness and viability. The study's target population were managers at all levels of the Gauteng province's IT industry, including first-line managers, middle and top managers. A sample of 383 project managers (n=383) from Gauteng province (N=70992 members) were chosen using a quantitative research strategy and simple random sampling.

1.6.4.2 Sampling technique

According to Martinez-Mesa (2016), a targeted population in research is made up of prospective participants (research subjects or objects) who create a sample to gather data. It is evident from the study's target population that project managers comprise this group.

Probability sampling and non-probability sampling are the two common sampling techniques (Saunders et al., 2016). Randomly choosing sample members is a component of non-probability sampling. Snowball, convenience and quota sampling are a few examples of non-probability sampling. Information is gathered from people who are easily reachable in the population through convenience sampling. Using this technique, one can locate individuals who can provide helpful information. Equal representation of particular population characteristics is necessary for the quota sampling method. Last, snowball sampling is the method of beginning with one individual and proceeding to the next on the basis of referrals from other people (Bless, Higson-Smith & Sithole, 2019).

Cluster, stratified, systematic and simple random sampling are the four techniques used in probability sampling. According to Saunders et al. (2016), every member of the population has an equal chance of being chosen in a simple random sampling. Every kth subject is chosen from the population using a systematic sampling technique, which begins with a random element between 1 and n. Stratified sampling is a technique that

divides a population into groups based on shared characteristics. The sample components are selected at random from each cluster formed by dividing the population. Clusters are the elements of the sample used by the researcher (Sekaran & Bougie, 2016).

1.6.4.3 Sample frame

The only connections the researcher used are those in his own network and those of other connections who are thought to fit the target population criteria.

1.6.4.4 Sampling method

To collect samples from a group of people who are simple to reach or contact, the researcher will use the convenience sampling technique. Owing to their proximity, it is simpler to get in touch with the people you are connected with on LinkedIn.

1.6.4.5 Sample size

According to Alvi (2016), the sample size is the total number of people chosen to participate in data collection using a preferred sampling technique. Consequently, a set of people chosen to represent the total population is called a sample. From a total of 383 managers 150 responded to the survey which is equal to 39% of the total population under study. Mughal et al. (2021) posit that a sample size of 10-27% of a well selected population (sample) is ideal for generalisation of the population in any research.

1.7 Data collection instrument

To gather consistent data from a sizable population, the study made use of structured questionnaires. By using questionnaires, the researcher could gather quantitative information that was then analysed quantitatively using descriptive and inferential statistics. Survey participants were asked to rate the frequency with which they engaged in the behaviours mentioned in the statements created by operationalising the variables. According to Zohrabi (2013), surveys are undoubtedly a way to gather primary data for any research project, a pilot survey (testing the instrument) was done and the questionnaire restructured with assistance from a statistician.

1.7.1 Validity and reliability

1.7.1.1 Validity

The main goal of every study is to analyse the data accurately to guarantee that the research questions are addressed successfully. Data validity, is the significance ascribed to constituent parts of research. The integrity of the conclusions drawn from research is referred to as validity (Saunders et al., 2012). Validity of a measurement tool is determined by how well it accomplishes the task for which it was designed.

To ensure that the research was covered adequately, the researcher defined the study carefully in the literature review. The researcher's findings were accepted as legitimate after careful consideration of all participants, their data and usage of appropriate sampling techniques, as well as the fact that they were not based on a few respondents who had been selected arbitrarily. The statistician and the supervisor were consulted for expert advice and they carefully evaluated how well the instrument represented and connected logically to the underlying theory, research objectives and phenomena under study. This helped to verify the research instrument.

1.7.1.2 Reliability

Regarding reliability, it is important to consider how much the measurement method can be relied upon to produce consistent results after repeated use (Weiner, 2007:6). More research has revealed that consistency is what defines reliability and, as a result, the strength of the questionnaire is a key factor (Saunders et al., 2012). If a study will yield consistent results over time and under various circumstances, such as when using various samples or interviewers, it is said to be reliable. Studies, experiments, tests, or any other measuring procedure tend to produce the same results after they are conducted repeatedly on various samples. The research instrument was evaluated for test-retest reliability to guarantee reliability. For data reliability testing, the researcher used Cronbach's Alpha.

1.8 Data collection method

For this study, closed-ended questions were used in online questionnaires. The study's best method was chosen after considering available resources, such as budget and schedule. The survey administration method determines the survey design (Saunders et al., 2016). The surveys were distributed via email attachments, the SurveyMonkey website and Google Forms. These distribution techniques were employed because of the widespread accessibility of the internet. However, delivery and collection were also used to avoid under-representing specific demographics.

1.9 Data analysis method

For any study to respond successfully to research questions, the data should be accurately analysed. The structured questionnaire data were entered into an SPSS 27 spreadsheet and cross-referenced with data entered by the researcher into a different spreadsheet as a final check. A statistical tool from SPSS 27 was used to clean and code the data. Descriptive statistics for each variable, including frequency means and standard deviations, were applied before regression analysis was used to further analyse them.

1.10 Ethical considerations

Informed consent of participants in a study is key to research ethics. Saunders et al. (2016) state that the goal is to engage individuals who are agreeable to participating in the study following obtaining all relevant details and their consent. The consent form is an official document ensuring that the information collected during the study is confidential and is a sign that participants involved in the study do so voluntarily. Furthermore, it gives confidence that the respondents' privacy and identification will be safeguarded and that they will not be discriminated against.

In this study, the respondents' protection was ensured. Throughout this study, no one was hurt. All respondents were treated fairly and with respect and the data analysis results were shared. A consent form was signed by all participants indicating that their participation would not result in any psychological or emotional harm. The former refers to harm to one's mental well-being while the latter relates to harm to one's emotional well-

being (Saunders et al., 2016). The language that was used in this study is respectful to guard the respondents' emotionally and psychologically.

During this study, the confidentiality and respondents remaining anonymous was ensured. By the respondents signing a consent form, their anonymous state was preserved. There were no provisions in the confidentiality agreement requiring participants to disclose their identities. There was no identity disclosure when the results are presented, and anonymity was treated equally with confidentiality. The study results were disseminated based on age group, educational attainment and other pertinent factors that cannot be used to identify study participants specifically to protect participant confidentiality and anonymity. For the sake of respondents' privacy, surveys were conducted securely and respondents were required to reveal their identities (Saunders et al., 2016). Respondents signed a consent form to ensure confidentiality and privacy.

This study ensured that the authorities granted permission. It is unethical to conduct research without the consent of the university and the study subjects (Creswell, 2017). The researcher adhered to the postgraduate ethical standards of Cape Peninsula University of Technology (CPUT). Prior to requesting any information from the study subjects, written consent must be obtained (Saunders et al., 2016:194). In an ethical clearance letter, CPUT also granted permission to conduct this study.

1.11 Outline of the dissertation

Chapter 1: Introduction to the study.

Chapter 2: Review of pertinent and accessible literature.

Chapter 3: Description of theoretical and conceptual foundations of 4IR leadership.

Chapter 4: An explanation of the research methodology used in this study.

Chapter 5: Findings, a thorough examination and interpretation of the numerical data, and the suggested model.

Chapter 6: An overview of the findings, conclusions and recommendations.

1.12 Limitations of the study

Since the study ultimately included only 150 participants, it is possible that the results cannot be applied to managers or other institutions, but they may still have significance for other types of organisations. Time and money constraints also limited the scope of this study. However, given that the study was self-funded, using more managers to collect data may not have been practical.

1.13 Demarcation/delimitation of the study

Managers in charge of 4IR technology implementation were the only ones eligible for this study. The study was also limited to virtual teams technology as it is the most applicable 4IR technology used on a day-to-day basis by techno-savvy individuals. This study was also constrained by timing issues, such as the fact that it is a cross-sectional study, which means that no extensive longitudinal study is feasible or could offer more insight.

CHAPTER TWO: LITERATURE REVIEW

INFORMATION TECHNOLOGY COMPLEXITIES AND USE OF CLOUD COMPUTING IN CONTEMPORARY PROJECTS

2.1 Introduction

The first chapter focused on how managing new and developing technologies in a project setting requires a transformation in leadership. To ensure the successful implementation of scientific and technological advancements, traditional leadership approaches are insufficient. This chapter explores sustainability in project management, cloud computing utilisation, IT project complexity, and IT as a subset of project complexity in cloud computing to lay the theoretical groundwork for the research and give a thorough understanding.

2.2 Sustainability in project administration

Since organisations' resources are no longer viewed as limitless, sustainability has garnered attention recently—particularly from an organisational standpoint (Shafiee & Topal, 2009:181; Kendall & Willard, 2016; Azizi, 2005). According to Keeys (2014), implementing projects that are in line with the organisation's strategies is typically how an organisation's sustainability is ensured. Clinning and Marnewick (2017:1) assert that an organisation's project management capabilities bear significant responsibility for ensuring that not only the organisation's financial sustainability but also the sustainability of the planet and its inhabitants are considered. Project managers have significant influence over how sustainability is applied within the company (Wang, Wei & Sun, 2013:246; Silvius & Schipper, 2014). Gareis et al. (2013) claim that the management paradigm has shifted, with sustainable development now taking precedence over sustainability as an option.

Evaluation of a more specialised area of project management, such as information technology (IT) project management, reveals even less about sustainability. Finding the gaps or the necessary actions to put things right thus becomes challenging. Furthermore, because there appears to be little research on sustainability in IT projects, it is challenging

to understand and apply sustainability concepts in project management (Herazo, Lizarralde & Paquin, 2012:84; Martens & De Carvalho, 2014; Ugwu & Haupt, 2007:665; Edum-Fotwe & Price, 2009:313). This gap stands out even more when considering the African continent in particular (Silvius & Nedeski, 2011:1; Herazo et al., 2012:84; Hedman & Henningsson, 2011:54).

The literature that is currently available on sustainability and project management is also perceived to be interpretive and conceptual (Silvius & Nedeski, 2011:1; Silvius et al., 2012; Martens & De Carvalho, 2014). According to Martens and De Carvalho (2014), additional empirical study is required to comprehend the integration of sustainability principles into project management.

2.3 The use of cloud computing

As the cornerstone of 4IR, cloud computing (CC) is a relatively new development in information technology (El-Gazzar, Hustad & Olsen, 2016; Roblek, Meško & Krapež, 2016). According to Mell and Grance (2011), CC provides scalable, as and when needed services with minimal management for individuals and firms. Businesses are interested in implementing CC services owing to the benefits of CC (Almubarak, 2017; Ristov, Gusev & Kostoska, 2012; Zhang, Cheng & Boutaba, 2010; Rosenthal et al., 2010; El-Gazzar et al., 2016).

Paying for what has been consumed enables the use of CC. Armbrust et al., (2010) asserts that because it uses the utility computing concept, this model is referred to as the "pay-as-you-go model". According to Subramanian and Jeyaraj (2018) and Buyya, Yeo and Venugopal (2008), the ability to concentrate on major business operations and other company activities (for example invention and creating value) as opposed to managing and maintaining software and hardware is another important advantage that CC provides to IT organisations (the cost-effectiveness and flexibility of CC include not having to pay for maintenance, support, or licensing. Because it usually only calls for operating costs as opposed to capital investments, it is less complicated and simpler to implement.

The primary reason CC vendors are used by IT organisations to maintain IT services and infrastructure is because they have the necessary IT expertise. The use of CC is

comparatively recent, and project management conventions in IT management have not been set (El-Gazzar et al. 2016; Stendal & Westin, 2018. The topic of CC projects' management and whether such projects should be handled in contrast to regular IT projects is still only briefly covered in a few sources (Conway & Curry, 2012; Wang et al., 2016).

Stendal and Westin (2018) indicate that the research community has not given CC implementations much attention. Cloud computing is nonetheless unfamiliar with the issues that matter most when making decisions about adopting CC, and lacks empirical support for those beliefs (El-Gazzar et al., 2016). Owing to these gaps, it is necessary to decide whether CC projects are sufficiently different from regular IT projects to be classified as a special type of IT project. This is accomplished by having a deep comprehension of the variables affecting CC projects from the angles of project complexity, knowledge domains for project management and techniques of project management.

This section's objective is to aid readers in comprehending the concept of CC. The definition, character traits, product offerings, deployment, benefits and challenges of CC will be discussed. Cloud computing, a development in IT, is the foundation of the 4IR (World Economic Forum, 2016; Marnewick & Marnewick, 2020). Pay-per-use Internet-based services are used to supply and consume IT resources (computers, storage, networks and software) (Vaquero et al., 2008; Mell & Grance, 2011; Leavitt, 2009).

Three primary areas of difference between traditional IT and CC are in terms of ownership, provision and upkeep of IT resources. According to Accorsi (2011) and Wang et al. (2016), conventional IT involves the installation, ownership and delivery of IT resources on the networks and physical spaces of the company. Organisations are in charge of maintaining these IT resources in this scenario. In contrast to owning and maintaining the resources, with CC, organisations only request the IT resources they need and only pay for what they use. In this instance, the CC providers own and manage the IT resources.

Multiple CC definitions exist. Cloud computing is a type of parallel and distributed system consisting of a collection of interconnected and virtualised computers that are dynamically

provisioned and presented as one or more unified computing resource(s) based on service-level agreements established through negotiation between the service provider and consumers (Buyya et al., 2008). Additionally, CC is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications and services) that can be rapidly provisioned and released with little management work or service provider interaction (Mell & Grance, 2011). With three delivery models, four deployment models, and five essential features, this cloud model supports availability. Along with the definition already provided, the delivery and deployment models of CC are the primary areas of focus.

2.3.1 Characteristics of cloud computing

As indicated in Table 2.1, CC demonstrates the following traits (Buyya et al., 2008; Mell & Grance, 2011; Rosenthal et al., 2010).

Table 2.1: Characteristics of cloud computing

Ad-hoc self-service	When necessary, the organisation can automatically access computing resources without assistance from the service provider. It can use various standard mechanisms, including a tablet, laptop, smartphone and other gadgets to use CC features online.
Extensive network access	The provider can provide computing services and share them with several organisations without the organisations being aware of the location from which the computing services are provided (Rosenthal et al., 2010; Mell & Grance, 2011; Marston et al., 2011).
Flexibility and quick provisioning	Based on the need for resources, this refers to the capacity to elastically provide and release computing capabilities. Rapid provisioning enables the organisation to anticipate its future demand needs. When necessary, resources are automatically added or removed (Rosenthal et al., 2010; Mell & Grance, 2011; Marston et al., 2011).
Pay-as-you-use	Organisations pay for computing resources on a usage-based basis; there is no upfront cost for the resources. Pay-as-you-use has the benefit of reducing the capital costs that organisations incur when purchasing computing services (Mell

	& Grance, 2011; Rosenthal et al., 2010; Marston et al., 2011). Typically, in routine IT projects, the product or solution is implemented in a conventional data centre that is run by the organisation. There are many services available in the CC environment that can affect how a solution or product is deployed on the infrastructure of the service provider.

2.3.2 Cloud computing models

The three primary cloud computing models are Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) (Subashini & Kavitha, 2011).

- Software as a Service (SaaS) denotes a cloud service model where cloud providers manage the platform, software/application, and infrastructure layers of the cloud service stack (Leavitt, 2009; Vaquero et al., 2008; Mell & Grance, 2011). Secure access to the applications and their data is the consumer's responsibility.

- Infrastructure as a Service (IaaS) enables the use of network, storage, and processing power as a service. It is the consumer's responsibility to manage and secure access to the operating systems (O/S), databases and applications that are installed on this infrastructure (Mell & Grance, 2011; Vaquero et al., 2008; Leavitt, 2009).

- Platform as a Service (PaaS) refers to a scenario in which cloud service providers manage the platforms and underlying infrastructure, such as databases, middleware and application development tools that let users create and utilise applications.

2.3.3 Models for deploying cloud computing

There are five primary cloud deployment models that businesses use. Table 2.2. provides an overview of these.

Private cloud	A single organisation is in charge of managing and maintaining all cloud services. With other organisations, there is no sharing of resources or duties (Vaquero et al., 2008; Mell & Grance, 2011; Leavitt, 2009). An organisation needs to commit a significant amount of funds, resources and time to building a private cloud (Dawoud, Takouna & Meinel, 2010; Wang et al., 2016).
Public cloud	Cloud service providers are in charge of hosting and managing clouds. The organisation can maintain and manage certain cloud services, such as databases and operating systems. Public cloud services are less costly because resources are shared by multiple organisations, but security is a worry (Mell & Grance, 2011).
Hybrid cloud	Because the organisations use both public and private CC services at the same time, this is a combination of the two.
Community cloud	This type of CC is shared by various organisations with the same goals, responsibilities and purpose (Mell & Grance, 2011).

2.3.4 Benefits and drawbacks of CC

With a low barrier to entry, cloud computing enables businesses to access and use IT resources quickly. Because these organisations already own data centres and do not need to purchase costly IT infrastructure, this is possible. A further benefit of CC is that organisations only pay for the IT resources they use; therefore, there is no need for upfront capital to buy the IT resources. It takes less time to deploy IT resources and to complete the procurement process.

With the help of all these advantages, businesses can enter the market more quickly and stay competitive. Because of cloud computing's flexibility, businesses can also handle unpredictable spikes in IT resources' demand. It releases businesses from the day-to-day maintenance and management of their IT assets, enabling them to focus on their core skills and generate revenue (Wang et al., 2016; Marston et al., 2011; Armbrust et al.,

2010). One of the biggest obstacles to organisations adopting CC is security. Concerns raised by organisations include the safety of their data in the cloud, the locations of data storage and the auditing procedures for cloud use. They believe that because their IT assets and data are kept in the cloud, they no longer have control over them. Because the cloud is distributed, it can be difficult to comply with international regulations (Subramanian & Jeyaraj, 2018).

According to Tatikonda and Rosenthal (2000), project complexity is influenced by several factors, including the product or service's originality and uniqueness, its development process, performance goals and its interdependence in terms of technological advancement and difficulty. According to this definition, CC's novelty, interdependence with regard to technological advancement and difficulty make it qualify as a complex project. This assertion is reiterated by Hür Bersam and Gül Tekin (2019), who contend that Industry 4.0—of which CC is a component—brings complexity and uncertainty. Consequently, an IT project is inherently a CC project. Therefore, before one can understand the complexity caused by CC projects, it is imperative to look into and understand the complexity caused by IT projects.

2.4 Complexity of IT projects

Project management research on complexity is extensive (Botchkarev & Finnigan, 2015; Daniels & LaMarsh, 2007; Murray, 2002; Wallace, Keil & Rai, 2004; Whitney & Daniels, 2013; Xia & Lee, 2004). According to Baccarini (1996), a project's complexity refers to one that comprises numerous interconnected components that can be operationalised in terms of interdependency and differentiation. Furthermore, according to Baccarini (1996), any project type can use this definition of project complexity. Wood and Ashton (2010) indicate that a "single or a combination of factors that affect the responses/actions taken to achieve the project outcomes" constitutes project complexity.

Tatikonda and Rosenthal (2000) posit that project complexity is influenced by various factors, including the product or service's uniqueness and novelty, development process, performance objectives and interdependence regarding technological advancement and

difficulty. According to Lu et al. (2015), a project is complex when it comprises of numerous different interconnected parts, and dynamic and emergent features.

An extensive review of the literature led to the classification of eight categories—organisational, technical, size, uncertainty, project management itself, people management, environmental management and dynamics—that best describe the complexity of IT projects (Bakhshi, Ireland & Gorod, 2016; Merali, 2006; Mitleton-Kelly & Land, 2005; Murray, 2002; Poveda-Bautista, Diego-Mas & Leon-Medina, 2018; Williamson, 2011; Xia & Lee, 2004).

- Organisational complexity involves and consists of elements that have an impact on the organisation as a whole, such as organisational components, organisational structure, organisational units and the changes that the related elements cause (Bakhshi et al., 2016; Botchkarev & Finnigan, 2015; Marnewick et al., 2017; Mitleton-Kelly & Land, 2005; Murray, 2002; Poveda-Bautista et al., 2018; Williamson, 2011; Xia & Lee, 2004).

- Technical complexity considers elements related to technology and processes that use it (Bakhshi et al., 2016; Botchkarev & Finnigan, 2015; Marnewick et al., 2017; Merali, 2006; Murray, 2002; Poveda-Bautista et al., 2018; Williamson, 2011; Xia & Lee, 2004).

- Environmental complexity includes the circumstances surrounding the completion of projects, which may include economic, social and legal factors (Botchkarev & Finnigan, 2015; Marnewick et al., 2017; Mell & Grance, 2011; Merali, 2006; Poveda-Bautista et al., 2018; Williamson, 2011; Xia & Lee, 2004).

- Uncertainty includes the present and potential future states of various project-related factors, which can be challenging to forecast. It emphasises the past, present and future, considering stakeholders, technology, activity, goals and triple constraints (Bakhshi et al., 2016; Botchkarev & Finnigan, 2015; Marnewick et al., 2017; Mitleton-Kelly & Land, 2005).

- Project change management, including changes to the project from the inside as well as the outside, is the focus of dynamics (Botchkarev & Finnigan, 2015;

Marnewick et al., 2017; Merali, 2006; Mitleton-Kelly & Land, 2005; Murray, 2002; Xia & Lee, 2004; Bakhshi et al., 2016).

- The size of a project considers the quantity, importance and magnitude of all project-related factors (Bakhshi et al., 2016; Botchkarev & Finnigan, 2015; Marnewick et al., 2017).

- All aspects of a project, including scheduling, scoping, methods, tools and techniques, are addressed by project management complexity (Bakhshi et al., 2016; Botchkarev & Finnigan, 2015; Marnewick et al., 2017; Murray, 2002; Williamson, 2011).

- All the human-related elements that have an impact on the project are included in people management (Botchkarev & Finnigan, 2015; Poveda-Bautista et al., 2018; Marnewick et al., 2017; Williamson, 2011; Bakhshi et al., 2016).

2.5 Information Technology's subset of cloud computing project complexity

2.5.1 Project complexity

To maximise CC's benefits and minimise associated risks, it is imperative to decide whether CC projects need to be managed differently than conventional IT projects. According to literature, there are specific CC project complexities that fall under the categories of organisational, financial, governance, compliance, legal and technical projects (Akar & Mardiyan, 2016; Almubarak, 2017; El-Gazzar et al., 2016; Rai, Sahoo & Mehfuz, 2015). Projects using cloud computing would automatically inherit the challenges of IT projects. Therefore, cloud computing project complexity categories are integrated into IT project complexity categories to produce an exhaustive list of cloud computing project categories. The comprehensive categories of CC project complexity are people management, dynamics, environment, technology, organisation, finance, governance and uncertainty.

Current best practices for project management have not yet been adopted or created to manage CC projects because CC is still a relatively new concept (El-Gazzar et al., 2016;

Stendal & Westin, 2018). Numerous references describe the capabilities, traits, advantages and architecture of CC, but there are still only a few that address the management of CC projects specifically (Conway & Curry, 2012; Wang et al., 2016). According to Wang et al. (2016), the current project management references are not yet ready or prepared to be considered a solution when it comes to managing cloud-based community projects as they move from on-premises to the cloud.

2.5.2 Project administration

This section's primary goal is to look at the project management knowledge and skills required to implement CC. Project management is described as "the application of knowledge, skills, tools and techniques to project activities to meet the project requirements" in the PMBOK Guide (Project Management Institute, 2017:25).

The project management literature identifies two themes that are critical for project management: (i) project approaches and (ii) project management standards and methodologies. It has been determined that these themes should be adopted and applied (Iivari, Hirschheim & Klein, 2000; Project Management Institute, 2017; Zandhuis & Stellingwerf, 2013).

2.5.2.1 Project management approach

According to Iivari et al. (2000) and Introna and Whitley (1997), the term "project management approach" refers to the set of rules and guidelines that specify how a project should be managed. The process of choosing an approach is important because it helps to organise and structure the project's work. This will make it easier to select the associated life cycle of the approach. According to Kuruppuarachchi, Mandal and Smith (2002), these approaches range from highly predictive ones that assume context knowledge to ones that deal with highly adaptive, unpredictable and volatile environments.

Waterfall and Agile are the most commonly utilised methodologies. According to Cockburn and Highsmith (2001) and Vinekar, Slinkman and Nerur (2006), agile places

more of an emphasis on innovation and adaptation than does the Waterfall approach, which emphasises prediction and control.

2.5.2.2 Standards and techniques for project management

A standard is defined by Vukomanović, Young and Huynink (2016:25) as "a document, established by consensus and approved by a recognised body, which provides for common and repeated use, rules, guidelines, or characteristics for activities or their results, aimed at the achievement of the greatest possible degree of order in a given context". An official document outlining accepted norms, procedures, processes and practices is what the Project Management Institute defines as a standard (Project Management Institute, 2017). Despite the fact that standards are reportedly not frequently used in project management (Ahlemann, Teuteberg & Vogelsang, 2009), the researchers opine that these improve communication within the project environment and contribute to project success (Grau, 2013; Thobejane & Marnewick, 2020; Vukomanović et al., 2016). The Project Management Institute (PMI) has divided project execution into two phases or parts, namely, the five (5) project processes and the ten (10) knowledge management areas.

2.5.3 Project management process

These are the different phases projects pass through from the time an individual decides on having a project (execution of some unique undertaking) through the stages to completion. These phases are critical in that they involve the initiation, the planning and execution to the handout phase, in a particular order. Monitoring and evaluation are critical components of the project execution to align the planning and the triple constraints to align and mitigate risk of failure of the undertaking.

Table 2.3 highlights the project management process.

Table 2.3: Project management process

Initiating	Authorising the project.
Planning	Defining objectives, selecting the best course of action.
Executing	Coordinating people and resources to implement the plan.

Controlling	Monitoring, measuring progress and identifying gaps.
Closing	Bringing the project to an orderly end.

Source: Keshta (2019)

The planning phases of the project are critical as they involve intense analysis of the project including the resources required (material and human) as well as identifying stakeholders. The involvement of stake holders from the beginning is of critical importance to allow for a full understanding of what the project objectives are including the expectations of the stakeholders **(**Matu, Kyalo, Mbugua & Mulwa, 2020**).** Many researchers opine that it should be considered important to identify the project leader in time and get them involved in the initial stages (inititation) to enable them to contribute and equally understand the details of the project **(**Flick & Flick, 2024.**)**

Research over the years has enabled a better understanding of what constitutes an effective project manager, and these are taken in consideration of PMBOK (2013). An effective project manager is characterised by their ability to show certain behaviour patterns, as illustrated in the table 2.4 below.

Table 2.4: Characteristics of an effective project manager

Being a visionary	Managing Relationships and Conflict
Communication	Ethics & Integrity
Loyalty	Decisiveness
Managerial skills	Charisma
Empowerment	Focus on the most important things

SOURCE: own construction

Apart from the competencies above, an effective project leader should be able to build a business case for the project and take the followers with. Whilst these are largely competencies of the team that is involved in the project, the project leader is the coordinator of the project and has to integrate all the functions and sections of the project (Yang, Kuria & Gu, 2020**)**. Central to all activities in the project execution process is communication with stakeholders, both internal and stakeholders as this is critical in the successful execution of the project (Akhwaba, Bowa & Keiyoro, 2020).

There is a high project failure rate averaging 47% in construction projects (Rajala & Aaltonen, 2021) and 62% in related Information Technology projects (Nguyen et al., 2020). The causes of project failures have been researched on, and the presence of technological advances would have been a panacea to this situation. Increasingly the focus is on the role played by the project coordinators (leaders) as this remains the only variable that can make the difference (Coccia, 2023). Studies have identified characteristics of project leaders that have high project failure rates, and these are illustrated in table 2.5 below.

Table 2.5: Characteristics of ineffective project leaders

Lacking Active Listening Skills	Overcompensating To Hide Insecurities
Differentiating Leading from Managing	Being Reluctant to Admit Mistakes
Believing You Have All the Answers	Falling Out of Touch with Employees
Building An Ego Based on Your Title	Failing To Build Trust
Striving For Perfection	Hesitating To Ask for Help
Needing To Solve Every Problem	Habitually Procrastinating
Behaving Inconsistently	Lacking Empathy
Lacking Courage	Being Unaware of The Power of Your Words
Lacking Accountability	Lack of emotional intelligence

SOURCE: own construction compiled from literature

The failure of project execution processes is basically a human factor problem because projects are conceptualised by human beings, executed by human beings and designed for the benefit of human beings. Since the execution is done by human beings (the only part of the system that can think), it is critical to look closely at the role played by these leaders (Richardson, Marion Jr, Anantatmula & Gibson, 2022)

Table 2.6: A comparison of best project managers versus other project managers

Process	Best project managers	Other project managers

Initiating	2%	1%
Planning	21%	11%
Executing	69%	82%
Controlling	5%	4%
Closing	3%	2%

Source: Keshta (2019)

Strong leadership is characterised by effective and consistent communicating of a clear vision and the ability to listen and participate actively in discussions (Quirke, 2017). Responsiveness is second nature to effective leaders as that is critical for both operational purposes and the morale in the team, both of which are motivating to the follower (Elder, 2016). Should there be any slackening of any of the competencies, training (relevant to task) should be provided including to the project leader where necessary. The shortage of any of these will severely impede project execution process and may allow for risk inscription that could have been avoided.

To be effective, a project manager will need to have a toolkit that will assist with the execution process, outside of leadership competencies. The ability to plan and meet the triple constraints is facilitated for (made possible) by the use of tools that allow for efficiency evaluation and execution, these tools have been developing all along. Research has identified tools that are indispensable in the effective execution of projects. Awojide, Hodgkinson and Ravishankar, (2018) identified tools that will make project execution more efficient as illustrated in table 2.7 below.

Table 2.7: Project manager's toolkit

Project charter	Project definition document
Project requirements	Project schedule

Status report	Milestone charts
Project organisational chart	Responsibility matrix
Project requirements	Project schedule
Status report	Milestone charts
Project organisational chart	Responsibility matrix
Communication plan	Quality management plan
Staffing management plan	Risk response plan
Project plan	Deliverables summary
Project Management Software:	Gantt Charts:
Risk Management Tools:	Communication / Collaboration Tools:
Stakeholder Management Tools:	Quality Assurance Tools:
Project log	Project respiratory
Change request form	Project notebook

SOURCE: Awojide, Hodgkinson and Ravishankar (2018).

The effectiveness of a tool depends on the people using the tool and the relevance of the tool to the tasks that are to be performed (Jensen, Pals & Willaing, 2016.). These tools can be useful and assist tremendously in the relevant aspects of the project, but the manager needs to know and understand the use of the tools, better still there should be a subordinate trained in this. The typical example of the tools and techniques needed for effective execution would be the Gantt chart. A Gantt chart is a bar chart illustrating project schedules (Bourne & Weaver, 2018.) and these can be used to monitor and evaluate the project progress and in the identification of project risk areas in advance, allowing for mitigation.

A Gantt chart is as a tool allows manager to develop a schedule for the operations and involves two parts, namely; a grid or task list and the project time lime. The key elements of the **Gantt chart;**
1. **Tasks**: the activities to be performed towards the execution of the project processes
2. **Timeline**: the time needed to complete certain tasks and the start time for the next activities showing the interrelatedness
3. **Task dependencies**: this shows which tasks must come first, which ones can be done concurrently 'simultaneously and which ones follow

Gantt chart is common in all project and manager's toolkits, and this is illustrated in table 2.8 below.

Table 2.8: An example of an IT project plan layout
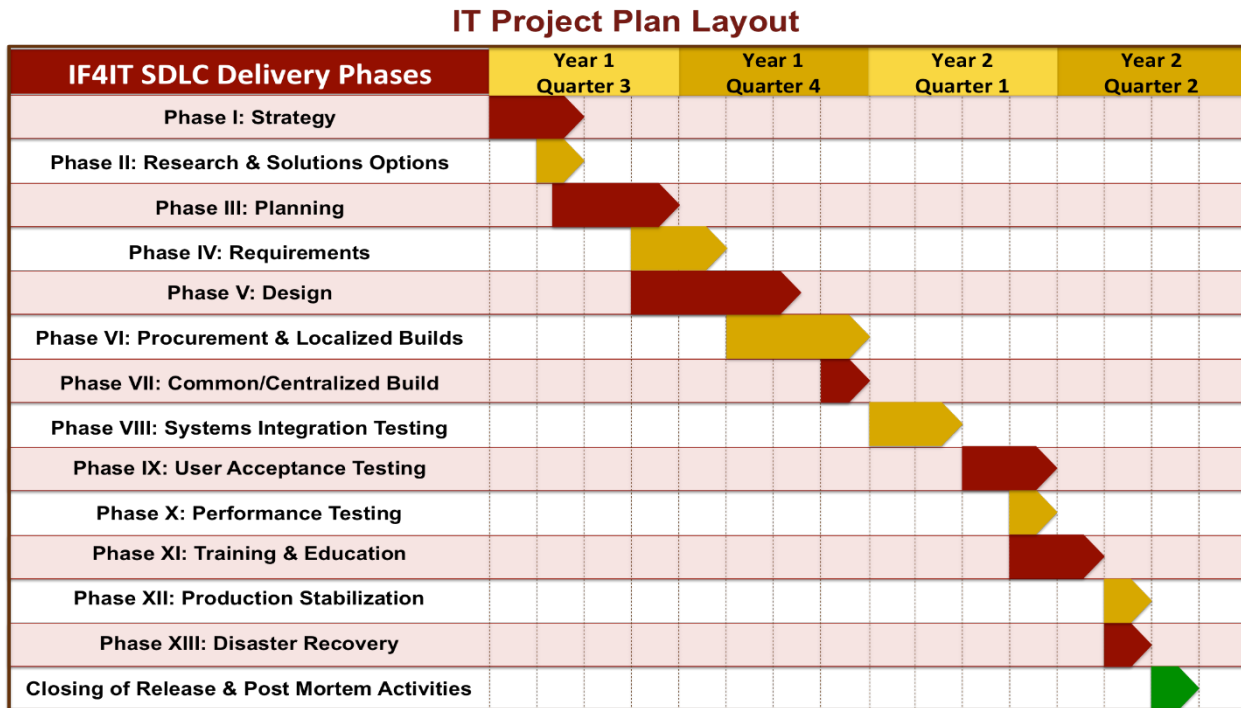
Figure: Example Layout of SDLC Phases as Key IT Project Milestones

Source: Keshta (2019)

CHAPTER SUMMARY

A project by nature (from the definition) is complex in that it needs specific methods of operation for it meet the requirements for success as stated as stated in the iron triangle (triple constraints). Some of the factors contributing to this complexity will be, among others, the size of the project, the number of project practitioners performing tasks, the type of tasks to be performed, the level of technological advances and interdependence of the tasks. With the current failure rate and inbuilt uncertainties in the execution of these unique products, add the 4IR, which is new to everyone in the industry and the use thereof means all the practitioners will have to learn as they progress. One expects that extensive training and interaction may be the way forward, specifically before there are no Lessons Learnt books to refer to. The managers need to renovate on operational strategies and design appropriate responses to the dimensions on the degree of structural complexity

and technological advancement now utilising machines where warm bodies were earlier used.

CHAPTER THREE: LEADERSHIP AND PROJECT SUCCESS IN THE INFORMATION TECHNOLOGY SECTOR

3.1 Introduction

Since the mid-1960s, "projectification" has advanced both quantitatively and qualitatively. This is due to the fact that during that time, the growth of service providers and businesses that specialise in offering business support to manufacturing firms has posed a threat to the dominance of manufacturing. Going by the definition of what a project is, all projects regardless of the discipline they fall under have the same basic project management principles (Chrimes et al., 2020). The major principles of a project would therefore be that every project will have a project structure, goals to be achieved, start and end time, quality specifications, and the budget for the final product. Regardless of the activities, these principles (as derived from the definition) are universal among projects (Crawford, 2024), and this includes information technology projects. With advances in technology post the industrial revolution, specifically in developed economies, the number of people working directly in manufacturing began to decline. However, this was more than made up for by an increase in the number of people working for project-based business service providers and independent contractors (Bakker, 2010).

Consequently, a large portion of the work in the manufacturing sector began to be managed by project-based organisations that were not part of the conventional, functional, product-based industrial company. Projects were used by service departments within conventional industrial organisations for knowledge-intensive tasks such as research and development, in addition to these project-based organisations. A new area for project organising and entrepreneurial behaviour emerged in the latter part of the 1990s, with the focus on clusters and their function in creating business opportunities (Bakker, 2010).

An ex-ante project outlines the objectives for carrying out a task, the amount of time allocated, and the delegation of accountability to ensure that the task is completed with the available resources and within the designated time frame. It is commonly known that projects frequently fall short of the objectives regarding roles, tasks completed, finances and deadlines (Porter, 1990).

3.2 Leadership and project management

A project manager's effectiveness depends on various situational factors as well as team characteristics; therefore, it is obviously impossible to define a universal approach (Larson & Grey, 2014). However, Larson and Grey (2014) outline a set of eight fundamental characteristics in project management: the managerial process that they think can contribute to project management success: (1) having a systems-thinking approach; (2) maintaining one's integrity; (3) taking the initiative; (4) possessing a high degree of emotional intelligence (EQ); (5) possessing a broad understanding of business; (6) employing efficient time management; (7) being an astute politician; and (8) having an optimistic outlook. According to Larson and Grey (2014), a successful project manager needs to be able to "walk the talk". The conduct and performance of team members are greatly influenced by project managers; therefore, it is crucial that they exhibit certain leadership behaviours, styles and attitudes.

3.3 Project type and leadership profiles

Muller and Turner (2007) examined a range of leadership profiles to investigate whether the characteristics of an effective project manager would change based on the type of project. Muller and Turner (2007) used a model of intellectual, emotional, and managerial competence, or IQ, EQ, and MQ, to identify the leadership styles of successful project managers. Muller and Turner (2007) conducted interviews with managers and supervisors to determine the criteria that these individuals used to select qualified project managers for various types of projects. A questionnaire that was completed online was also used to determine the leadership style that project managers who were deemed successful in different project areas used.

While different leaders have different leader behaviour patterns with the two extremes between task oriented and relationship oriented (Tannenbaum & Schmidt, 2017), the situations determine leadership styles to be applied. Over the years the literature has tended to move towards transactional and transformational leadership styles as dominant, even though other styles continue to apply in specific circumstances or as hybrids or blends (Olutoye & Asikhia, 2022.). There is no universal leadership style as leadership also depends largely on who cognitive prototypes and leaders lead people who have views, opinions, perceptions, let alone expectations (Jowah, 2013).

Vaagaasar, Müller and De Paoli (2020) established that there is a direct relationship between tasks, environment, the workforce and the leadership style adopted by effective project leaders.

3.4 Leadership styles

The investigation of leadership styles within project contexts was not considered in prior meta-analyses, although the use of project teams and project-based organisations has increased dramatically in the last several years. To reconcile and evaluate the contradictory evidence about the effects of transactional and transformational leadership on project success, Abbas and Ali (2023) carried out a meta-analysis. Abbas and Ali (2023) found that transformational leadership had a higher likelihood of influencing project success than transactional leadership. The results also showed that project-level variables, notably project size and project type, moderated the relationships between leadership styles and project success. Additionally, some of the relationships were also influenced by national factors, including the nation's economic standing, collectivism and power distance (Abbas & Ali, 2023).

Many leadership styles and their relative importance for employee and organisational productivity have been studied by scholars during the last few decades. Within groups, these leadership philosophies include: transactional leadership (Burke et al., 2006:288), transformational leadership (Abbas & Ali, 2023:125), distributed leadership (Agarwal et al., 2021:249) and informal leadership (Abbas & Ali, 2023:125). Significant research has

been conducted on transformational leadership and transactional leadership in the context of functional organisational settings (Abbas & Ali, 2023:125).

According to Burke et al. (2006:290) and Ceri-Booms, Curşeu and Oerlemans (2017:178), transformational leadership is perceived as a people-focused or person-oriented leadership style, while transactional leadership is perceived as a task-focused leadership style. Transformative leaders go above and beyond self-interest in addition to displaying intellectual stimulation, idealised influence (charisma), inspirational motivation and individual consideration (Bass et al., 2003:207; Avolio, Bass & Jung, 1999:441).

These leaders develop and articulate their vision, foster intellectual growth in their followers and put the team's interests ahead of their own (Bass et al., 2003; Avolio et al., 1999:443). Conversely, transactional leaders work to motivate their subordinates by providing conditional rewards, closely monitoring their progress and stepping in when necessary (Ceri-Booms et al., 2017:180; Bass et al., 2003:207). These leadership styles have been shown in numerous meta-analyses to be beneficial in raising followers' job motivation, job performance and creative thinking (Abbas & Ali, 2023:130).

Various studies carried out in functional organisations have examined the impact of transactional and transformational leadership on job outcomes. Nevertheless, scholars have paid less attention to how these leadership philosophies affect project-related outcomes, specifically project performance or success.

Moreover, there is a lack of definite agreement in the published literature regarding the effectiveness of these leadership styles in project-based organisations. While some studies (Aga, Noorderhaven & Vallejo, 2016:808) found a positive correlation between transformational leadership and project success, others (Liphadzi, Aigbavboa & Thwala, 2015:284) believed that transactional leadership was essential. Scholars studying project management will thus need to ascertain the relative importance of these two leadership styles in affecting project outcomes.

Furthermore, these contradicting results regarding the primary impacts of leadership styles raise the potential that moderators exist in these relationships (Abbas & Ali, 2023:132). Similarly, studies have demonstrated that a range of contextual factors, such

as the project's nature, scale and participants' cultural orientations, can affect the relationship between leadership styles and project performance in multicultural settings (Abbas & Ali, 2023:134). The contingency perspective on leadership, which contends that contextual variables determine a leader's effectiveness, also lends credence to this viewpoint (Abbas & Ali, 2023:134). Projects oriented to change, for example those involving IT, for example, may require transformational leaders more to ensure the project's success because they rely on ongoing innovation for growth. Transactional leaders, however, may be more successful in projects involving routine labour or ones that do not frequently call for innovations and modifications, for example construction projects.

Avolio et al. (1999:448) and Bass (1985) suggest that transformational leaders may also perform better in projects in collectivistic cultures than in individualistic ones because of their selflessness, individualised consideration and team-orientedness. Furthermore, earlier research on international project teams indicates that a lot of project activities currently transcend national boundaries (Eriksson et al., 2007:1512). Managing projects with participants from various cultural backgrounds is extremely difficult (Eriksson et al., 2007:1512). However, previous research on the subject of international projects offers very little insight into the function of culture and leadership in project management (Abbas & Ali, 2023:134).

To determine the relative importance of these two leadership philosophies for project success, it is imperative that the existing literature be reviewed and evaluated from both a theoretical and practical perspective. More specifically, a meta-analysis of the prior research is essential to a summary of the impacts of both transactional and transformational leadership styles on project success as well as an examination of their boundary conditions. The effect of leadership styles on team outcomes has not been extensively studied in meta-analyses. However, the majority of these studies have focused on the behavioural and attitudinal outcomes—such as team cohesiveness, team coordination and team learning—as well as the subjective and objective performance—such as productivity and real sales—in functional teams (Burke et al., 2006:305).

Unfortunately, none of these meta-analyses have focused exclusively on how leadership styles affect project success. Therefore, critical knowledge about the suitability of various leadership philosophies in project contexts is lacking (Abbas & Ali, 2023:140). According to Abbas and Ali (2023:140), the effectiveness of leadership styles for team performance varies depending on whether the organisation is functional or project-based. First, the success or performance of a project is not the same as that of a group or team. To achieve the project goals, communication, procurement and budget, functioning organisations usually do not define regular tasks for individuals or teams in terms of scope, time, risks, costs, or budget; rather, projects are defined primarily in terms of these factors. The success or failure of a project, for example, depends on several performance-related factors.

According to PMI (2017), meeting the expectations of project stakeholders and ensuring that the clients are satisfied with the completed project are key components of a successful project. The general definition of team performance is the degree to which a team succeeds in accomplishing its tasks and goals, or the extent to which a team fulfils its mission. Second, individuals or teams working on projects are relatively more vulnerable to uncertainties about potential changes in clients' requirements, budget, schedule, or scope over the course of the project life cycle than individuals or teams working on routine tasks (Fu, Li & Chen, 2012:363; Eriksson, Larsson & Pesämaa, 2017:1520).

Third, members' responsibilities may vary from one project to the next and the nature of work may be contract-based (Braun, Ferreira & Sydow, 2013:862). Similar to this, due to the dynamic nature of projects, organisations may need to form new teams each time a new project is started; therefore, project teams rarely have a history of working together across multiple projects. The nature of the job or the work environment usually does not change for employees carrying out routine tasks in functional organisations. Ultimately, working on a project is a team effort that necessitates a high degree of task interdependence and regular communication.

Over time, there has been a notable surge in the dependence on project teams and project-based organisations due to the swiftly evolving business environments (Ceri-

Booms et al., 2017; Huemann & Silvius, 2017; Bakker, 2010). The contemporary project landscape is characterised by several cross-national project operations, which necessitates a detailed understanding of the ways in which leadership styles interact with various project aspects and national cultures to influence project outcomes. According to Liu, Meng and Fellows (2015), these elements are paired with irregular work schedules, a lack of organisational routines, the integration of internal and external experts across disciplines and cultural variations among project managers.

3.4.1 Transactional leadership

Transactional leadership demonstrates how the relationship between a leader and a follower is driven by self-interest through highlighting the interaction between the two (Alrowwad Abualoush & Masa'deh, 2020). Alrowwad et al. (2020:196) assert that the exchange of employee benefits – material or psychological rewards given by the leader in an organisation to the employees – serves as a fundamental business tenet and that it can be reinforced by the threat of punishment. Transactional leadership can be classified into three categories: passive management in exceptional cases, active management in exceptional cases, and transactional leadership in contingency cases (Bass, 1985:463).

Leaders within an organisation are responsible for overseeing and managing the business, motivating staff and setting goals to meet the objectives set forth by the top leaders of the organisation or company. One of the different types of leadership is transactional leadership. As stated by Burns (1978), transactional leaders identify and address the expectations of their followers by creating a strong link between effort and reward. Conversely, Couto (2007) asserts that, in transactional leadership, supervisors have the power to assess, correct and provide training for subordinates whose performance needs to be improved.

In addition, they have the authority to acknowledge excellence when the intended outcome is realised. Thus, it is evident how to lead employees when a leader adopts this style. According to Susanto and Sawitri (2022), employees in an organisation need to possess a leadership spirit to oversee their fellow members and to accomplish organisational objectives. According to research by Brahim, Riđić and Jukić (2015), transactional leadership styles are generally positively and significantly related to the

performance associated with offering positive rewards when an offender achieves set goals, or offering negative consequences when an offender does not achieve the desired goal. Employees must be closely observed in relation to their performance within an organisation or company.

The manager must enhance the function of transactional leadership styles in the organisations he oversees to develop and improve leadership styles. This study includes transformational leadership variables in addition to other variables. Employee performance and organisational performance are linked because organisations require workers, and workers follow instructions from managers, supervisors and even directors. Employee accomplishments, ideas and perceptions of external competitors all contribute to the formation of an organisation's performance. The study findings from Muwardi et al. (2020) indicate that these two variables are significant for organisations with higher levels of job performance (JP), employee performance (EP) and intellectual capital (IC).

Additionally, research by Samwel (2018) indicates that there is a strong positive correlation between employee relations and both employee performance and company performance. Utrilla, Grande and Lorenzo (2015) also reveal that training has an impact on organisational performance indicators as well as on individual performance. When workers are driven to work and possess high levels of competence, they will perform well (Susanto, 2022).

3.4.2 Transformational leadership

Examining the innate leadership philosophies of a leader, we cannot ever dismiss the transformational leadership model, since, as the organisation evolves, the leader will always be at the forefront of overseeing this change. A leader who demonstrates charismatic behaviour and motivates others by paying attention to them is said to possess transformational leadership qualities. This allows them to inspire their subordinates to take the lead and to lead change with confidence, earning the full support of the people they lead at every step of the process (Ali & Ibrahim, 2014).

According to Yukl (2009), the following three elements are inextricably linked to effective transformational leadership behaviour:

i. Work-oriented: This type of conduct is focused on getting the work done, being adept at making the most of personal and external resources and being capable of carrying out all organisational tasks in a sustainable, controlled and orderly manner.

ii. Relationship-oriented: This approach emphasises developing positive relationships with other people, boosting collaboration and teamwork, inspiring employees to be more satisfied with their work and cultivating a sense of loyalty towards the company.

iii. Change-oriented and open to change: This includes encouraging and committing to change, paying attention to improvements in strategic decisions and adapting to changes in environmental behaviour. It also involves raising the values of creativity and innovation to be able to make significant changes in the way that work/process, products and services are performed. Last, it involves increasing environmental behaviour.

Similarly, Bass (1985) asserts that transformational leadership is a type of leadership influence on the people/subordinates they lead. According to Ali and Ibrahim (2014), these individuals will feel motivated to go above and beyond what is expected of them because they believe, are proud, loyal and respect their superiors. Three methods are available to a transformational leader to inspire their followers:

- Encouraging participants to recognise the significance of the worth of a job well done.

- Encouraging participants to prioritise the organisation over their own interests.

- Seeking to meet more of the members' higher order needs, such as actualisation and self-esteem needs.

Therefore, it can be concluded that the definition of leadership encompasses all activities involving the application of communication skills and abilities, the organising of someone to persuade others to act in a way consistent with their desires, accomplishing predetermined objectives through the application of techniques or expertise and setting

an example of charisma and leadership, which is viewed by followers as having the power to improve circumstances and accomplish goals – both personal and organisational – in the eyes of followers. When leaders can motivate their followers to give their all towards the accomplishment of organisational objectives and to put the success and interests of the organisation ahead of their own, that leadership performance is deemed new and effective.

3.5 Leadership style and project success

The role of a project manager's particular leadership style in determining the success of the project is another area to investigate under this category. Jiang (2014) noted this concept after reviewing studies on project style, project success variables and their relationships to leadership styles and the impact of leadership styles on project success in an effort to ascertain whether there is a relationship between leadership style and project success. Jiang (2014) looked at the historical overview of leadership theories and the relevant leadership styles they defined, including trait leadership (leadership style not defined), behaviour or styles (for example, directive, supportive, participative, achievement-oriented), contingency (for example, visionary, charismatic, transactional, transformational, laissez-faire), emotional intelligence (for example, visionary, coaching, affiliative, democratic, pacesetting, commanding), and competency (for example, engaging, involving, goal-oriented).

In addition, a study looking at the connection between leadership style and project success (Jiang, 2014) as well as project success factors (such as project mission, schedule and plans, personnel, communication, troubleshooting, et cetera) were looked at. These included emotional competencies (EQ), managerial competencies (MQ) and intellectual competencies (IQ). According to Jiang's (2014) analysis, there is a correlation between a project manager's leadership style and their capacity to affect or even control factors that contribute to project success. A simple model that demonstrates how a project manager's leadership style affects teamwork and ultimately project success was developed by Jiang (2014). However, it is important to remember that the type of project one is working on will also affect how successful the collaboration is on the project. For example, if a project manager is not familiar with the type of project they are managing,

they might be less able to decrease project success. Nonetheless, the project manager may be able to lessen the negative effects with careful management and other competencies if they can choose the appropriate leadership style (Jiang, 2014).

Thus, although most research does not emphasise this relationship, Jiang (2014) found that a project manager's leadership does, in fact, have an impact on several relevant factors, such as teamwork and client communication. Jiang (2014) also found that a project manager's leadership style affects the success of the project in two ways: directly, through leveraging corresponding competencies, and indirectly, through fostering teamwork, which also benefits the project (Jiang, 2014:54-55).

CHAPTER SUMMARY

Information technology has revolutionized the world and brought the globe within reach in many aspects, and the advances in technology continue to emerge. Even though there is a high project failure rate in IT, yet this is an industry that has become indispensable in our day to day life and activities, personal or business. The success of Information Technology projects, like any other projects, is not solely dependent on the advances in technology and techniques, but is strongly informed by the leadership and followership. The soft skills remain a critical component of the execution of projects since projects are designed by human beings, for human beings and executed by human beings. Leadership then becomes a critical component of the execution of projects, in this case with specific reference to IT projects. The project leaders need specific competencies to be able to effectively execute the IT projects and minimize or mitigate risk of the project failing to be completed within the specifications of the triple constraints. It is important that these projects be successful since IT is critical in establishing competitive advantages for organisations considering the global nature of business today. IT cannot be wished away as it continues to redefine the global business terrain and understand leadership patterns most ideal for the execution of these complex projects. Leaders need to be knowledgeable about the competencies ideal for the effective execution of these products, thus leader competency and skill are the focus for this study.

CHAPTER FOUR: RESEARCH DESIGN AND RESEARCH METHODOLOGY

4.1 Introduction

The world is gradually moving towards the 4IR with technological advances in every aspect of life, yet the failure rate of project execution remains high. One critical element of element of effective project execution is project leadership (Szatmari, Deichmann, van den Ende & King, 2021), and there is no project execution without project leadership. The changes in the technology to be used and compounded by the looming advent of 4IR creates high levels of uncertainty. As stated in contingency management theory **(**Müller, Sankaran, Drouin, Vaagaasar, Bekker & Jain, 2018**)** the leadership has to change to be appropriate to the situation to be effective, considering the diversities among the project practitioners. Leadership practices and ethos will be impacted on in the same way that the employees will be affected, therefore the focus is on leadership to provide direction on this matter. With the increase in management by projects in the industry in general, it is expedient that leaders must change their leadership styles and adjust to context relevant situations that will come in because of 4IR.

4.2 Research background

Research has been defined in various ways by different academics and researchers. According to Saunders et al. (2003), research is any activity that people engage in to gain new knowledge through conducting systematic investigations into unknown subjects. Inductive and deductive methods are used in research (Babbie, 1998), which is a systematic investigation aimed at describing, explaining, predicting and controlling the observed phenomena. Research differs from gathering information and making decisions in three ways (Phillips & Pugh, 2005):

- A system of open thought underpins research.

- Researchers evaluate the data critically.

- When making generalisations, researchers set their limitations.

To conduct research, a problem or area of interest must first be identified. The problem must be transformed into a research problem and data must then be collected, analysed and reported.

Generally, the research process has three major dimensions: ontology, epistemology and methodology. Thus, a research paradigm is an all-encompassing system of interrelated practice and thinking that defines the nature of enquiry along these three dimensions. The term *paradigm* originated from the Greek word *paradeigma* which means *pattern* and was first used by Thomas Kuhn to denote a conceptual framework shared by a community of scientists, which provided them with a convenient model for examining problems and finding solutions. Kuhn (1774:460) defines a paradigm as "an integrated cluster of substantive concepts, variables and problems attached with corresponding methodological approaches and tools". It refers to the research culture with a set of beliefs, values and assumptions that a community of researchers has in common regarding the nature and conduct of research (Kuhn, 1974:459). A paradigm, therefore, implies a pattern, structure, framework or system of scientific and academic ideas, values and assumptions.

Ontological and epistemological aspects concern what is commonly referred to as a person's worldview, which has significant influence on the perceived relative importance of the aspects of reality. Two possible worldviews are: objectivist and constructivist. These different ways of viewing the world have consequences in most academic areas. However, neither of these views is considered to be superior to the other. In some cases, both may be appropriate for some purposes, and insufficient or overly complex for other purposes. In addition, a person may change their view depending on the situation.

The following paradigms will be discussed in this assignment, namely pragmatism, realism, positivism and interpretivism. Each of these paradigms has both advantages and disadvantages. Each of them also has a unique way of contributing to provide researchers with a holistic framework and multiple view to address key social issues. Therefore, an interrelated application of these paradigms in research studies should ensure that the best notion of validity, reliability, relevance and oriented action is achieved.

Table 4.1: The distinctions between qualitative and quantitative methods

Orientation	Quantitative	Qualitative
Worldview presumption	A single reality that is quantifiable with an instrument.	Various realities.
Objective of research	Determine the connections between the variables that are being measured.	Gaining insight from the viewpoints of participants in a social scenario.
Research procedures and techniques	• Prior to the start of the study, procedures are set. • A hypothesis is formulated before research can begin. • Deductive in nature.	• Adaptable and evolving tactics. • Design emerges as data are collected. • A hypothesis is not needed to begin research. • Inductive in nature.
Researcher's role	The researcher is ideally an objective observer who neither participates in nor influences what is being studied.	The researcher participates and becomes immersed in the research/social setting.
Generalisability	Universal context-free generalisations.	Detailed context-based generalisations.

4.2.1 Pragmatism

James (1842–1910), Dewey (1859–1914) and Pierce (1939–1914) developed the American pragmatist school of thought. According to Mounce (1997), the forefathers of pragmatism "opposed to those forms of scientism which arose in the nineteenth century

and were variously known as Scientific Rationalism, Materialism, or Positivism". A recurring theme in the pragmatist tradition is the notion that scientific knowledge ought to be assessed according to how well it guides human behaviour in the real world rather than according to how well it tells us "what is the case" in the world. Thus, pragmatism's core idea is the prioritisation of practice.

The foundation of pragmatics is the understanding that there will never be a complete or "correct" theory explaining any aspect of existence. It is impossible to fully comprehend anything about the world; reality is simply too complex for that to be feasible. Dewey made this very evident when he stated that "coping with the world is the aim of knowledge, not its representation" (Mounce, 1997:177).

In summary, pragmatism refers to the idea that we come to know the world through the practicality or usefulness of objects/concepts. Pragmatism refers both to a philosophic perspective and to political expediency. It is a term coined by C.S. Pierce to denote his analysis of meaning. He argued that our conception of an object is framed in its entirety by the conception we have of the possible practical bearings the object could conceivably have (Mills, 1964).

4.2.2 Realism

The following succinct statement from Hjorth, Jones and Gartner (2008:81) describes the world and how people cope with it: "the world has a 'reality'; an existence separate from the coping human being's perception or interpretation of it". William James emphasised that realist ontology is necessary and that there is a reality apart from our consciousness. Reality was a fundamental idea in Weber's life and academic writings, as demonstrated by Radkau (2009:79). He frequently referred to "science of reality" or *Wirklichkeitswissenschaft*. Weber argued that both subjective meaning-making elements and the objectively existing "real" world should be considered. He did not place one above the other. Thus, it is essential to study discourse, narrative and culture. Interpretivist researchers acknowledge the role of discourse and narratives in shaping reality. However, they often overlook the "socio-historical a priori" when discussing these elements and instead focus on how they "constitute" reality, such as the formation of identities and organisations through discourses (Luckmann, 1983).

The work by Berger and Luckmann (1967) is not a "social constructionist" text in the modern sense of the word; rather, it is a study in the sociology of knowledge that focuses on the institutionalisation process (Watson, 2008). Although Berger and Luckmann (1967:58) refer to social institutions as "symbol systems", they maintain that they are far more than human constructs that are subjective; rather, they have "a reality of their own, a reality that confronts the individual as an external and coercive fact".

In summary, according to Sayers (1983), realism is the point of view that there is a material world existing independently of our consciousness of it and which can be known by consciousness. This refers to the view that physical beings exist independently of being perceived (Benton, 1981:13). There are two general aspects to realism. First, there is a claim about existence and the second aspect is about the everyday world of macroscopic objects and their properties concerning independence (Miller, 2010).

4.2.3 Positivism

Positivism is a philosophical paradigm that sprung up in the 19th century. This followed Auguste Comte's denial of metaphysics and his opinion that it was only scientific knowledge that is able to show the truth regarding reality. However, it was established as an authoritative scientific method in the early 20th century by Vienna Circle members, such as Moritz Schlick, Otto Neurath, Karl Menger, Philip Frank, Herbert Feigl, Rudolf Carnap and Gustav Bergmann.

The Vienna Circle aimed at constructing a "unified scientific world-conception" that disregarded the use of philosophy as a method of learning regarding the true nature of reality. However, it failed as a logical philosophy of science owing to a crucial instability between its theory of "reality" and its theory of "knowledge" (Neurath, 1973).

Positivism embraced David Hume's theory of the nature of reality, that is, philosophical ontology. Hume maintained that reality is composed of atomistic and independent occurrences. He believed in the utilisation of the senses to gain knowledge regarding reality, that is, the scientific method. He further postulated that logical and philosophical reasoning could direct us to "see" non-existent links between occurrences happening at the same time. However, positivism also incorporated Rene Descartes' epistemology,

which is theory of knowledge. According to Descartes, reason is the best method to gain knowledge regarding reality. His employed deductive method suggests that occurrences are interconnected and ordered and thus, that reality is inferable and ordered. This internal instability ultimately weakened the defensibility of positivism (Descartes, 1998; Hume, 1993).

Positivism brought into play a vital influence on scientific practice in the social sciences for decades in the early 20th century, more so in the natural sciences where laboratory experiments can closely estimate the real-world domain; therefore, catering for precise forecasts. However, in the social sciences, human discretion and uncertainty make the laboratory experiment less authentic. Eventually, its internal instability resulted in the discarding of positivism in favour of scientific viewpoints like critical multiplism – founded on the view that no one method is enough to construct a valid understanding of a phenomenon. The use of critical judgement means looking into multiple research questions using multiple measures, samples, designs and analyses required to allow a convergence to a valid understanding of a phenomenon.

In summary, this is a philosophy that holds the view that it is only factual knowledge gained by observation (that is, the senses), including measurement, is trustworthy. In positivist studies, the role of the researcher is limited to data collection and interpretation in an objective way. In studies of this type, research findings are usually observable and quantifiable. They depend on quantifiable observations that lead to statistical analyses (Crowther & Lancaster, 2008).

4.2.4 Interpretivism

Most of the time, positivist viewpoints—such as the social sciences against the hard sciences, situatedness against generalisability and discourse against statistics—place interpretivism in opposition to these viewpoints. Denzin and Lincoln (2011) speculate that this view may have originated in the paradigm wars of the 1980s, when post-positivists and constructivists pushed for a more naturalistic but still legitimate scientific investigation in the empirical social sciences, leading to a rejection of positivist, quantitative research perspectives. According to Yanow and Schwartz-Shea (2014), the term "interpretative turn" was conceived to describe research practices that shift from dehumanised, objective

research to a rehumanised, contextual and reflective perspective that prioritises human meaning-making and knowledge assertions.

Most often, the interpretivist paradigm is used in conjunction with constructivism, post-positivism, naturalistic paradigm, qualitative inquiry and qualitative research. Conversely, positivists maintain that there is only one reality, and interpretivists contend that reality is socially constructed, subjective and multifaceted (Guba & Lincoln, 1994; Kraus, 2005; Lincoln et al., 2011).

From an epistemological standpoint, positivists search for causes and effects while measuring and quantifying phenomena to answer questions about the "knowability" of the phenomenon or topic of study (Flick, 1998). Interpretivists, on the other hand, support the "generation", "discovery" and "construction" of knowledge because they hold that data cannot be extracted or removed from context (Denzin & Lincoln, 2011; Yanow, 2014).

From a methodological perspective, many positivists use quantitative approaches to support their claims of generalisability, while interpretivists use a variety of approaches, instruments and strategies to ensure a thorough comprehension of the phenomena they study (Denzin & Lincoln, 2011). Interpretivist reflexive research practice is centred on the researcher's unique engagement with both the researched and their own research (Yanow, 2006).

In summary, this paradigm integrates human interest in a study. Therefore, "interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions such as instruments, shared meanings, consciousness and language" (Collins, 2010:1). The development of interpretivist philosophy is based on the critique of positivism in social sciences. Therefore, this philosophy emphasises qualitative analysis over quantitative analysis (Collins, 2010). Table 4.4 outlines characteristics of interpretivism.
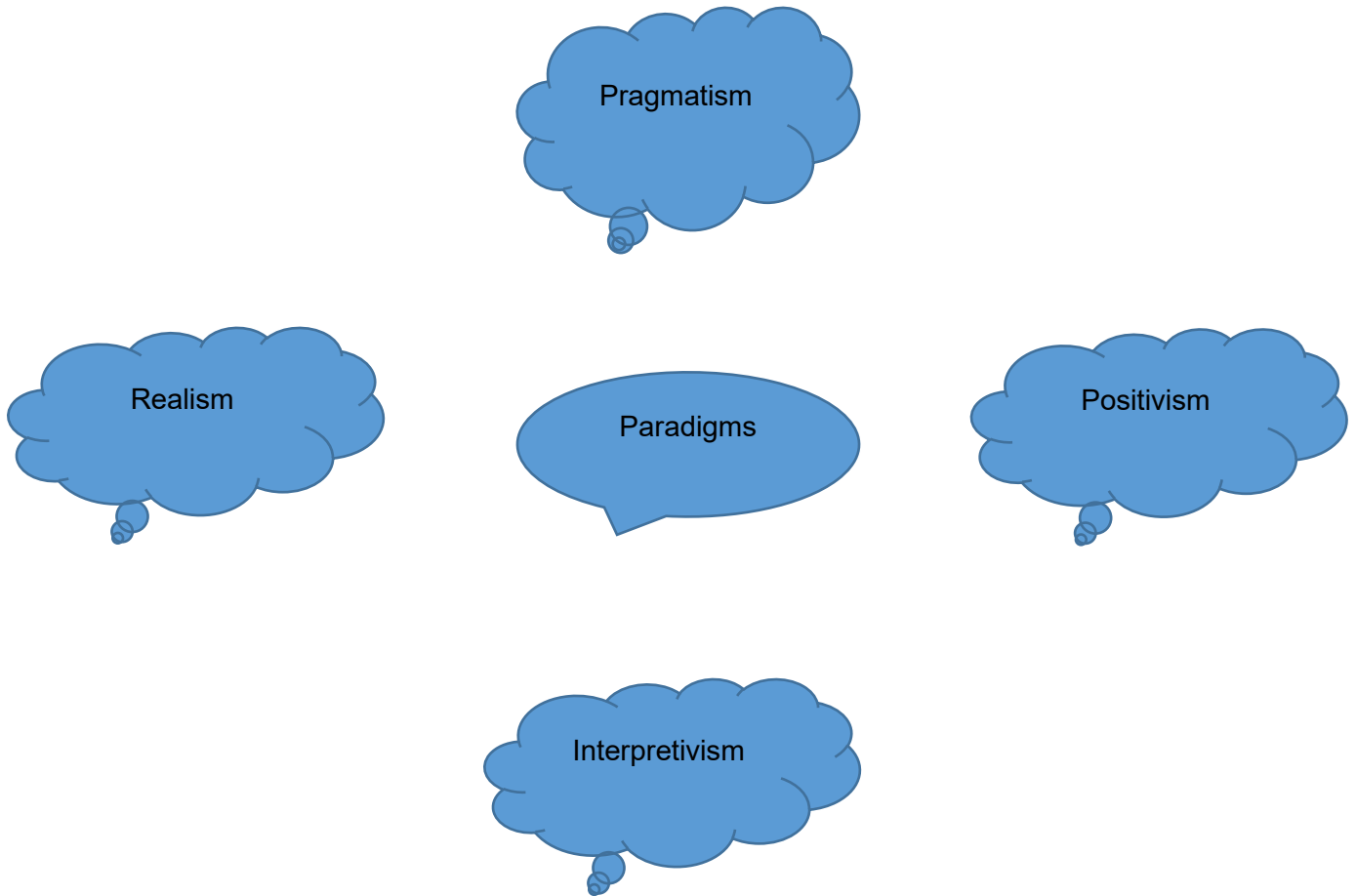
Figure 4.1: Different paradigms

4.2.5 Advantages and disadvantages of paradigms

The advantages and disadvantages of paradigms are summarised in Table 4.2.

Table 4.2: Advantages and disadvantages of paradigms

Paradigm	Advantages	Disadvantages
Positivism	With the methodologies and methods of collecting and analysing data based on evidence and statistics, the result of the	Human intention, attitudes and thoughts may not be observable, quantifiable through sensory experience, or supported by

Paradigm	Advantages	Disadvantages
	same phenomena may be allowed to replicate for different groups and subgroups of population in social contexts; thus researchers can save time and investment for using the findings of specific study for future quantitative predictions (Johnson & Onwuegbuzie, 2004).	evidence, making measurement of these phenomena impossible (Hammersley, 2013:23-24).
	Since data are collected under the view of objectivist epistemology, the findings of research can be reliable and support researchers to make scientific assumptions (Johnson, 2014).	Because positivism seeks to generalise research findings to a great extent, it runs the risk of ignoring people whose perceptions and understanding of any given subject can reveal a great deal about reality. Therefore, given the overall research findings, it might be difficult for researchers to apply directly to comprehend the phenomena in a given local context (Johnson & Onwuegbuzie, 2004).
		Since the respondents may occasionally select a random response instead of an honest one or may not be given the freedom to provide a response that is more pertinent to their individual circumstances, the accuracy of the scientific data gathered under this

Paradigm	Advantages	Disadvantages
		paradigm should be closely examined.
Interpretivist	With the diversifying views to look into phenomena, interpretivist researchers cannot only describe objects, humans or events, but also understand them deeply in social context.	It tends to leave a gap in verifying the validity and usefulness of research outcomes using scientific procedures (Cohen et al., 2011).
	Leveraging a key method of interactive interview which allows researchers to investigate and prompt things that we cannot observe, researchers can probe an interviewee's thoughts, values, prejudices, perception, views, feelings and perspectives (Wellington & Szczerbinski, 2007).	There is a lack of addressing the political and ideological impact of knowledge and social reality. The paradigm targets understanding of current phenomena rather than focusing on the problems related to the empowerment of individuals and societies.
Critical inquiry	Comprehending the interplay between issues and other social factors such as politics, economy and culture is simpler.	Limitations with regard to its application to research owing to restrictions on the researcher.
	This paradigm helps researchers to focus on raising the conscious awareness about core values and beliefs developed and influenced by researchers.	It can be challenging to notice changes because it can take time for an action's consequences to manifest in reality.

In conclusion, no one paradigm can be said to be the best for research. It depends on what one wants to achieve through the research being conducted. Research paradigms reflect our beliefs regarding the world we live in. For instance, pragmatism, as a new paradigm, disrupts the assumptions of older approaches based on the philosophy of knowledge, while promising new directions for understanding the nature of social research. However, there is no consensus on whether the research paradigms are opposed or whether they can be viewed as contributing a different role in the same study. The researcher opted for the pragmatic research paradigm.

4.3 Research design

The overall strategy used in order to answer research questions in a study by outlining theories and models underlying the project under study (Blair, Coppock & Humphreys, 2023). This is used for the effective information gathering necessary for answering the research questions in an effort to address the research problem. Research design indicates stage by stage the activities to be undertaken in the research, these are informed by the research objectives, which are the purpose for the research. Research design is a broad-based approach to conducting business/educational research (Saunders et al., 2012). Research design, according to Babbie (2010), is a framework for how the researcher intends to conduct the research. More than anything else, it resembles an action plan that the researcher wants to use in their study.

Research design is a blueprint of a scientific study. It includes research methodologies, tools, and techniques to conduct the research (Blair, Coppock & Humphreys, 2023). It helps to identify and address the problem that may rise during the process of research and analysis. The design helps in providing the structure and indicates the direction of the research process and serves as the glue that holds the research project together (Tobi & Kampen, 2018)). There are seven (7) types of research designs commonly used in research, and these are illustrated in table 4.3 below.

Table 4.3: Research design types

1	Quantitative research design	The design aims to find answers to questions like; what, where, who, when and how during the process. The outcome is easily presented as charts, graphs and numbers, it is quantifiable.
2	Qualitative research design	This design focuses on getting answers to how and why and gets information through open ended questions allowing the respondents to express their views
3	Experimental design	The problem is examined scientifically establishing a cause and effect relationship and seeks to understand the relationship between dependent and independent variables
4	Correlational design	It is the observation of two related variables overtime to draw up conclusions on how they interact and how the two variables relate to each other as positive or negative co-efficiencies
5	Descriptive design	This is a theory-based research which describes the primary subject matter using data collection techniques like surveys, natural observation or case studies, provides answers to why and how questions.
6	Diagnostic design	In this design the focus is on exploring reasons behind the issue and seek to find solutions to the problem at hand in a structured format by dividing it into 3 parts, namely, diagnosis of the issue, inception and solution for the issue.
7	Explanatory design	Involves exploration of concepts and ideas pertaining to the subject in a bid to identify undiscovered aspects and explore more theories to answer questions like, how, what and why.

d

SOURCE: own construction from literature

The researcher opted to use descriptive research design as it would enable to describe the phenomenon and allow for the use of both qualitative and quantitative research methodologies simultaneously. This in turn would allow for both breadth and depth in

understanding the phenomenon on which basis decisions and conclusions could be made.

A research design is crucial because it offers a visual representation of the researcher's intended structure and explains what needs to be done in technical terms. According to Blumberg, Cooper and Schindler (2008:69), a research design includes details about the following tasks: sample choice, sample size, data collection strategy, instrumentation, processes and ethical requirements. Serving as a bridge between the formulation of the research questions and the actual execution, it is more of a strategic framework. The best research design must be chosen to maximise the validity of the research findings.

4.4 Research methodology

Numerous methodologies are used to gather data, typically depending on the nature, goals and objectives of the study. Research methodology, as defined by Leedy and Ormrod's studies (2010), is the overall strategy that a researcher uses to conduct a research project. It focuses on the methods, resources and practices that will be used during the study. When choosing the research methods, it is important to consider whether the research goal can be achieved using qualitative, quantitative, or perhaps a combination of these two methods. Three methods for conducting educational/business research are observed: qualitative, quantitative and mixed-methods (Creswell, 2017). Mixed research methodology was adapted for the research because it would work well with the descriptive research design to give full understanding of the situation understudy. The description of the environment and or phenomenon was necessary in order to understand the issues involved in the process of the data collection process.

4.5 Research approach

To increase the validity of research, Creswell (2017) contends that it is crucial to illustrate the research methodology. This study used a quantitative and qualitative research methodology (mixed research methodology), aiming to look into how modern leadership is affecting projects in the 4IR of the IT sector. By achieving the following goals, this objective will be accomplished:

- Find a model that works best for transitioning successfully from current leadership behaviours to 4IR-contingent leadership styles.

- Determine how technology has affected the dynamics between leaders and members in the context of automated project management.

- Determine the part that 4IR plays in the project execution processes regarding the replacement of manual tasks and activities.

- Determine the leadership's skillset for performing well in dynamic agile project environments.

- Determine a career path for project management that is focused on 4IR.

- Determine the contingent sociocultural requirements for the growth of technologically literate, visionary project leaders.

- Determine leadership strategies that are task appropriate and that support innovative uses of technology to alter behaviour and systems.

- Find an entrepreneurial framework that can help build a project-automation leadership model that is 4IR focused.

4.5.1. Quantitative research approach

Quantitative research is any study that deals with numbers and shows how different attributes are related. Quantitative research is primarily concerned with numbers and aims to infer relationships from empirical findings. This aids in describing phenomena and their connections. To conduct analysis, highly structured data must be gathered. The main goal of researchers is to establish a relationship between the variables and to frame that relationship as a question or a hypothesis. Many authors have provided explanations of the differences between qualitative and quantitative research (Thomas, 2003). The type of data used in qualitative and quantitative research approaches differs significantly. Compared to the hard, standardised and objective nature of quantitative data, qualitative data is soft, rich and in-depth.

To satisfy the researcher's goal, hard, objective and standardised data were required for this study. Because there was prior knowledge, standard methods could be used to collect data using quantitative research methods, which were more appropriate. Questionnaires were used in this study to collect data from the research participants. Creswell (2017) emphasised the use of survey questionnaires because they are a component of the quantitative method and typically collect data from a stratified sample representative of the entire population. The researcher could infer the behaviour of the things in the entire population using a small and affordable figure owing to the use of questionnaires.

4.6 Study population

The term "study population" describes a group of people who all share certain traits that the study finds interesting (Creswell, 2017). According to Creswell (2017) population refers to all potential units or components that could be a part of the investigation. Researchers should be specific about the components of their samples, boundaries and location, so that they have a target population to study (Creswell, 2017). The researcher took suitability and practicability into account for the objectives of the study. The study participants were project management professionals working in the Gauteng province IT sector, including first-line managers, middle- and top-level managers. In this sense, a project manager's decision-making process and that of the team were related to how the project would be conducted to meet its goals. Respondents from various social backgrounds and occupation levels made up the more diverse population of the study.

4.7 Sampling method and sample size

4.7.1. Sampling

Sampling is selecting of a population subset (statistical sample) of individuals, objects, etc intended to assist in estimating the characteristics of a whole population and make a generalisation about the population (Hossan, Dato'Mansor & Jaharuddin, 2023:209). The subset (sample) is expected to reflect the characteristics of the large population, if the characteristics are well defined and the sampling method used is appropriate for the study. Adhikari (2021:25) opines that a well-chosen or selected sample with the correct

characteristics, may need about 10% of the overall population (sometimes less) to be able to make a scientific generalisation about the population. A well-defined population accompanied by a proper sample will enable the researcher to get reliable and validy results, all things done well (Pandey & Pandey, 2021:41). For this reason, sampling is critical for any research that should be used for scientific purposes, there are two major types of sampling methods, namely, probability sampling and nonprobability sampling.

Probability sampling

Probability sampling is a sampling method that gives you the best representative elements of the population as it allows for unbiased selection of participants in the research **(**Rahman et al., 2022:45**).** Creswell (2018:157-159) describes probability sampling as technique used by researchers to extract samples from larger populations based on probability (random sampling). There are four (4) distinct types of probability sampling commonly used in research, these are;

- Simple random sampling
- Stratified sampling
- Systematic sampling
- Cluster sampling

Nonprobability sampling

Non-probability sampling technique is when the selection of the research sample is based on non-random criteria like availability, convenience, judgment or on a quota system. (Creswell, 2018:155-175) says it is a method in which a researcher selects the samples based on their own subjective judgement and not random selection and this depends heavily on the expertise of the researchers. This is widely used in qualitative research and mostly in observation and all members do not have a chance to be selected for the research. There are five (5) common types of non-probability sampling technique, these are namely;

- Convenience sampling

- Quota sampling

- Self-selection [volunteering]

- Snowball sampling

- Purposive (judgmental) sampling

The decision on what sampling is to be used depends on the researcher, but more importantly on the population, its distribution and possible problem or and advantages.

Sampling, or "observing a part to gather knowledge about the whole is an almost instinctive human act" (Creswell, 2017:100). The main goal of sampling in a study are to identify the representative subjects and thereby lessen subjectivity and bias. Second, it is to allow for inferences to be drawn between the results of a sample and the larger target population from which the sample was drawn. In this instance, all sampling techniques were examined and the most appropriate one was selected to gather information about the whole. The researcher used samples collected from a group of people who were easy to get in touch with or to reach using the convenience sampling technique. LinkedIn connections were easy to reach because they were accessible.

4.7.2. Sample size

Sample size selection is fundamentally a trade-off: a larger sample will increase the accuracy of the conclusions drawn, but expanding the sample requires more time and money (Creswell & Creswell, 2018). One hundred and fifty (150) participants were included in the sample to ensure that the results reflected the population accurately. The need to learn as much as possible about Gauteng IT project management professionals and their availability were considered. More precise results are found when the number in the sample is higher.

4.8 Data collection

To gather sufficient data, the researcher used quantitative data collection and analysis techniques. The use of quantitative data collection techniques ensured that the data could be interpreted effectively with the aid of figures. Information was gathered from IT project management experts in Gauteng, South Africa. Data can be gathered using various

techniques, including observing, interviewing, testing, selecting and analysing content (Babbie, 2010).

Quantitative research is research that focuses on numbers and establishes relationships between different attributes. Using quantitative methodologies allowed the researcher to present the relationship between the variables framed as a question or a hypothesis.

4.8.1. Research instrument – survey questionnaire

In a research project, Creswell (2017:100) emphasised the use of questionnaires as a likely method for gathering primary data. The most crucial part of questionnaire design is making sure it is "reliable, valid and unambiguous". To provide the researcher with quantitative or numerical data that is more effective and simpler to analyse, this study used closed-ended questionnaires. The goals of the study were decided upon and the researcher selected the data collection strategy. After the development and evaluation of the questions before receiving statistician approval, a pre-test was conducted with a selected group of potential interview subjects. Thereafter, adjustments were made.

Likert-scale scores from 1 to 5, were assigned to the questionnaires. In earlier studies, Leedy and Ormrod (2001) asserted that creating a list of statements pertinent to the topics being considered and including response scales for disagreement to agreement constitutes the construction of a Likert-scale. The list of benefits of Leedy and Ormrod (2001:185) as considered for the Likert scale were:

- Simple and quick to construct.

- The ability to discriminate between each item passes an empirical test.

- It offers a larger volume of data and is more reliable than the Thurston differential scale.

- The Likert scale is also used as an interval scale.

To avoid the misunderstandings that may occur when translating from one language to another, English was used. Surveys, according to Leedy and Ormrod (2001:185), give participants the assurance that their answers will remain confidential. The respondents can therefore be more sincere than they would be in a personal interview.

4.8.2 Data collection instrument

A questionnaire was constructed for the purposes of gathering the necessary data for the research. The instrument was sent on for a pilot survey to 15 project managers [who otherwise qualified for the research], and these were requested to make comments on how the questionnaire appeared in their view. With the help of a statistician, the questionnaire was reconstructed to make more relevant and appropriate for the research that was to be conducted.

4.8.3 Data collection method

Closed-ended online questionnaires were used in this study. The most suitable method for the study was chosen after considering resources such as budget and schedule. The administration method of the survey had the greatest influence on its design (Saunders et al., 2012). The surveys were made available through the SurveyMonkey website, Google Forms and email attachments as Word documents. These distribution strategies were chosen because of the wide availability of the internet. However, delivery and collection of hard copy questionnaires were also used to prevent the underrepresentation of specific demographics.

4.9 Data analysis method

Any study should have accurate data analysis to guarantee that the research questions are addressed successfully. The Statistical Package for Social Science (IBM SPSS 29) software was used to analyse the quantitative data to produce descriptive and inferential statistics. Data from the structured questionnaires were entered into an SPSS spreadsheet and cross-referenced with another spreadsheet that the researcher had keyed, to ensure accuracy. An SPSS statistical software package was used for data cleaning. All the variables were given descriptive statistics, such as frequency mean and standard deviation, and these were examined further.

4.10 Data validity and reliability

4.10.1. Validity

According to Sekaran and Bougie (2016), a questionnaire is valid if it captures the information as it purports to. Internal and external validity can be tested using a questionnaire. Internal validity is the study's ability to offer excellent theoretical and empirical evidence on a topic. External validity implies that the study's findings can be generalised (Saunders et al., 2016). Assessments of the construct, face, and content validity of the study questions were conducted. A measuring tool's content validity is its capacity to capture accurately the subtleties of a concept. Content validity was assured through pilot research with subject matter experts. Also suggested was a verified questionnaire (Creswell, 2017).

Face validity is determined by an expert in business leadership or technology in Gauteng. An expert assessed the test questions and determined whether the tool is an accurate gauge of the item (Saunders et al., 2016). For face validity, each measuring item was evaluated by experts to determine its conceptual relevance. Construct validity is when an instrument theoretically measures the main items. It was determined by ensuring an evaluated theoretical origin behind a questionnaire item (Sekaran & Bougie, 2016).

Validity is defined as the quality that measures correctness or meets the acceptable standards according to an existing expectation (Mohajan, 2017:59). It should be real and should be able to assist in determining how well a test or method can be used to measure what it seeks to or claims to measure. Validity helps in the determination of what tests are to be used for the research and this ensures that the researchers are ethical and cost effective in their research project and should measure the ideas or constructs of the question (Dunn, 2020:149). For the instrument or the research findings to be valid, the content of the instrument (questionnaire) needs to cover the relevant aspects to the study to enable a comprehensive understanding of the phenomenon under study (Aithal & Aithal, 2020:234). Over the years researchers have classified validity in many different ways, below are the four (4) most common types of validity, as illustrated in table 4.4 below.

Table 4.4: Types of validity

	Type of validity	Explanation of the validity
1	**Construct validity**	Assures that the measuring tool (questionnaire) represents what the research is focused on and helps in establishing the overall validity of a research method
2	**Content validity**	This validity focuses on whether the instrument is representative of all the aspects pertaining to the study and of the construct. The content of the instrument must cover all the aspects of the construct.
3	**Face validity**:	This considers the suitability of the instrument on the surface and is more informal though similar to content validity and is considered somewhat a subjective assessment.
4	**Criterion validity**	This is on how well a test can predict the outcome of a research undertaking and how well it could be compared to results from other tests in measuring the accurately the results or findings

This classification is not relevant or common in experimental tests where other forms of validity doing experimental research must be consider(internal and external validity) which deal with experimental design and possible methods of the generalisability of results. The construction of the instrument used in this research was with the assistance of a statistician in order to produce what would be most ideal for the research.

4.10.2 Reliability

In statistics reliability is overall consistency measured by production of similar results under consistent situations **(**Cohen, Manion & Morrison, 2017:245**)**. The characteristics of these set of scores relate to the amount of random error that may be inherent in the scores. Observations of reliable scores show that they are consistent from one testing to another, and a generally reproducible and they are precise (Meng, 2020:10). There are different types of reliability classified as indicated in table 4.5 below.

Table 4.5: Types of reliability

There are several general classes of reliability estimates:

1	**Inter-rater reliability**	This assesses the extent of agreement between two (2) or more appraisals = same treatment for headache from different doctors
2	**Test-retest reliability .**	Focusses on score consistency from one test to another one test administration to another using the same methods
3	**Inter-method reliability**	Measures degree to which test scores are consistent even though they may be a variation in the instruments or methods used
4	**Internal consistency r eliability,**	A measure of consistency or reliability of an instrument (questionnaire) in measuring a given trait or construct and the extent of consistency of the results

SOURCE: own construction

Reliability and validity are not the same, but complement each other in providing results that can be depended on. That the instrument is consistent (reliable) may not mean that it is measuring the exact content required for the objectives of the research project (validity). It is also important to state that any test that is not reliable may not be valid and therefore not necessarily the right tool to use for the intended results (Heale & Twycross, 2015:67).

When an analysis is repeated, the same results will be obtained, which is what is meant by a questionnaire's being reliable (Bless et al., 2019). Cronbach's alpha was used to measure reliability. Cronbach's alpha is benchmarked at 0.70; thus, a lower value means unreliability (Saunders et al., 2016).

4.11 Ethical considerations

Ethical Research is defined as internationally putting in a research process that ensures researchers have good practices when they interact with research subjects (Madhushani, 2016:26). This is about the morality (doing the right things) within acceptable research ethics codes which protect the research objects, it is the duty of the researcher to care for the research objects (Cumyn et al., 2019:621). There is therefore a need for a researcher with integrity who will conduct the research process with the ethics considerations supreme in their minds and practice. CPUT has clear guidelines and processes that should be followed by the researchers in any activities where the name of the university is included, and these are, listed in alphabetical order in table 4.6 below.

Table 4.6: CPUT Key research ethical considerations

1	Anonymity	The respondents should not be known personally and their names should not appear on any of the questionnaires or research tools used
2	Confidentiality	Information about the respondents to the research is kept confidentially even if you know who they are, such information should not be released to any authority, privacy is demanded for
3	Fair subject selection	There should be equitable representation and the techniques used for sampling should be justifiable and scientific to enable production of valid and reliable findings
4	Informed consent	Respondents or participants must informed about their rights, the purpose of the study, the procedures, risks if and benefits if there are any, including protection due to them.
5	Independent review	The review process to be followed in the research undertaking should be impartial and must avoid all forms of subjectivity and any partiality
6	Letter of permission	The Ethics committee needs a leter of permission to study from a senior manager, etc of the organization where the research will be conducted. The letter should be fairly recent and specific.

7	Potential for harm	All activities and processes with the potential to cause bodily, emotional or social harm to the participants is not allowed, such will be monitored by the ethics committee along the way
8	Proposal review	Before the researcher can go out to research, the Research Ethics committee demands that the proposal should be reviewed and cleared of all possible infringements on the ethics codes.
9	Results and reporting	It should be known that plagiarism is considered unethical, and any such research will be submitted for plagiarism as a pre-condition for submission for examination and graduating.
10	Scientific validity	There should be justification for the study in which case it should be scientifically agreed on that there is a need for such an undertaking with intentions to add knowledge
11	Voluntary participation	No respondent to the research is to be forced, involvement is voluntary and the subjects can withdraw at any stage without having to justify why they are withdrawing

Ethics in research is defined in recent studies by Sekaran and Bougie (2013) as the code of conduct or expected societal norm of behaviour during the research process. Ethical behaviour should be observed by institutions, organisations, businesses and individual participants as well as by those who fund the research, conduct it and provide the data for it.

This research was conducted while taking the ethics and governance of the institution into account. All participants were briefed by the researcher, who ensured to respect their privacy and dignity. All the participants in the survey gave their free (voluntary) consent to participate in the study, knowing that they were free to leave at any time without providing a reason. The fact that they could skip any questions which they did not feel comfortable answering was made clear to them. Their confidentiality was guaranteed and upheld, and no information will be given to any authorities. The ethical clearance guidelines of the Cape Peninsula University of Technology were followed while conducting the study. The Ethical Clearance Committee granted approval for the project.

In adhering to the ethical guidelines and principles that apply to human subjects research, appropriate measures were taken to protect the rights of those participating as research subjects. These guidelines include, among other things, privacy, information ownership, respect for respondents' autonomy, and consent to take part in the study. An informed consent letter was used to explain the research to each participant.

4.12 Conclusion

The research design, research methodology and quantitative research design process were all covered in this chapter. In addition, the chapter covered the implementation of the research design, reliability and validity checks, and ethical considerations. The data collection and analysis approach, research methods, and data analysis techniques were also highlighted

CHAPTER FIVE:

FINDINGS AND ANALYSIS

5.1 Introduction

Chapter Five presents a detailed analysis of the perceptions of IT project management practitioners concerning leadership characteristics within the context of Industry 4.0. This chapter attempts to provide thorough insights into the necessary characteristics for encouraging agility, pushing change, and fostering self-organisation in modern project contexts by analysing descriptive data and their association with pertinent literature. This research makes a substantial contribution to our knowledge of the critical role that leadership plays in navigating the intricacies of contemporary project management techniques by closely examining the perceived relevance of these leadership traits and their alignment with the body of current academic literature. These observations provide insightful advice to companies looking to improve their leadership qualities and flexibility in a corporate environment that is becoming more technologically advanced and dynamic.

5.2 Response rate

Of the targeted 150 participants included in the sample size, all (100%) responded to the survey. The findings are guaranteed to be a fair representation of the population of IT project management experts in Gauteng according to this thorough response rate. In order to collect as much data as possible on this demographic group and to account for the availability of prospective responders, a deliberate choice was made to include 150 participants. Since a bigger sample size usually yields more exact results, the high response rate further improves the dependability and accuracy of the study.

5.3 Section A: Demographic data

5.3.1 Which of the following best describes your professional level?

The information shown in Figure 5.1 provides an intricate picture of the professional responsibilities held by the respondents to the survey. These roles included leadership, administrative assistance, on-site management, specialised knowledge, and a host of other occupations that are critical to the success of project-based initiatives. This variety highlights the collaborative and multidisciplinary character of project management as well as the significance of acknowledging and allowing for the wide range of roles and responsibilities that exist within project teams.
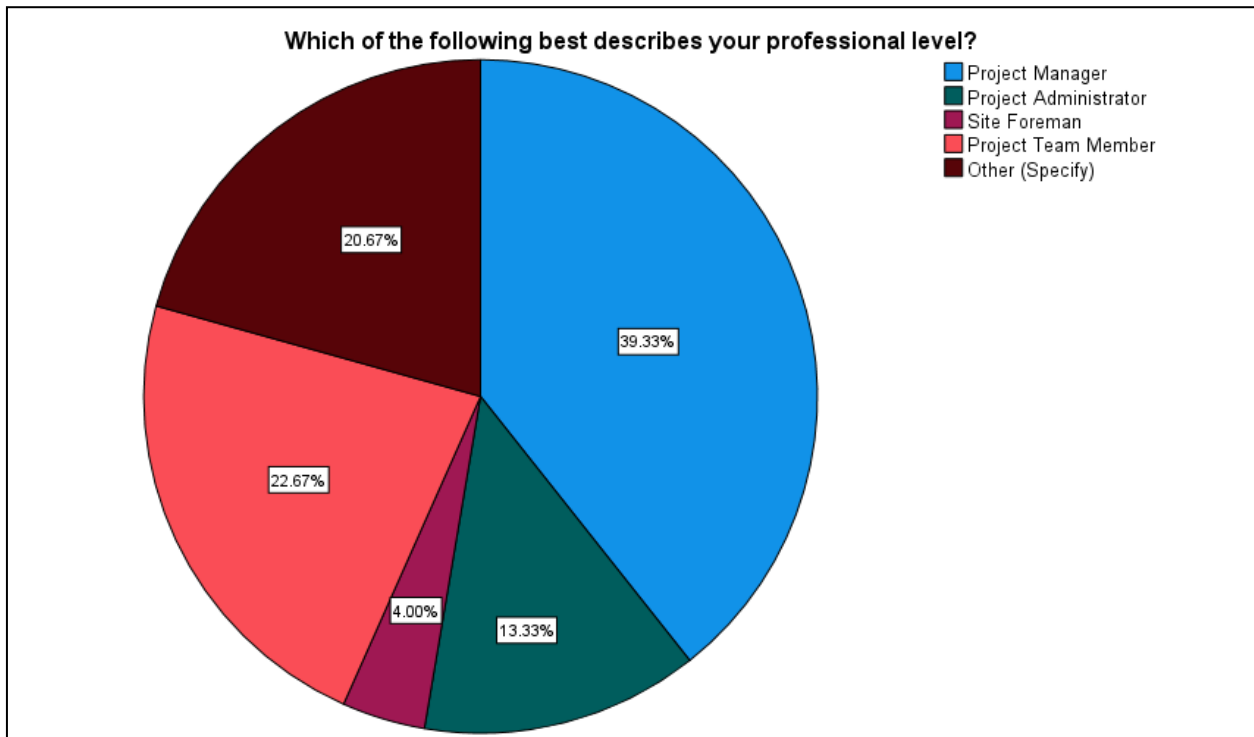
Figure 5.1: Which of the following best describes your professional level?

Upon analysing the distribution of professional jobs among the questioned population, it is clear that a wide variety of professions are present. The survey participants were mostly Project Managers, accounting for 39.3% of the total. This indicates a notable representation of persons in leadership positions within project management frameworks. Project Administrators make up 13.3% of the sample, which shows a significant number

of administrative support staff in project-oriented workplaces. Meanwhile, Site Foremen make up a smaller but significant fraction, accounting for 4.0% of the total. This suggests the existence of on-site managers who are responsible for supervising activities at project sites. In addition, the Project Team Members constitute a substantial share, comprising 22.7% of the participants. This indicates the presence of a significant number of persons actively engaged in carrying out projects, most likely providing specific skills or experience to project teams. Furthermore, a significant proportion of participants, amounting to 20.7%, are classified as Other, suggesting a range of jobs that were not specifically included as alternatives in the poll. This emphasises the wide range and intricate nature of professional positions within project management settings, where personnel have many specialised tasks and responsibilities that go beyond the predetermined classifications.

5.3.2 Which gender best describes you?

The data shown in Figure 5.2 demonstrate a very equitable gender distribution among the questioned population, with a slightly higher proportion of male respondents compared to female respondents. This underscores the need for advocating for inclusion and diversity in professional settings, creating an atmosphere where people of all genders are esteemed and treated with respect.
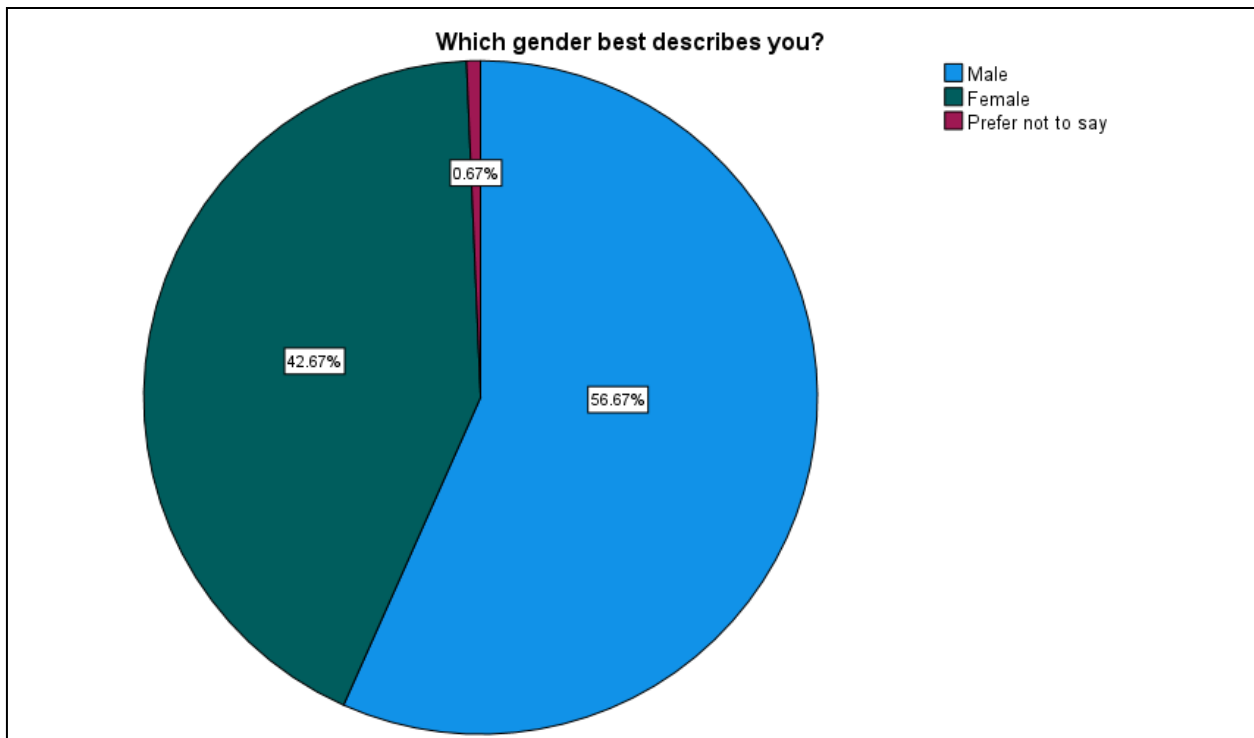
Figure 5.2: Which gender best describes you?

The analysis of gender distribution among the questioned population indicates a relatively equal representation; however, a small majority namely 56.7%, identify as male, suggesting a significant representation of males in the sample. On the other hand, the percentage of females in the surveyed group is 42.7%, which is also a significant proportion. This indicates a fair gender distribution, despite a small male majority. In addition, a small and insignificant fraction, amounting to 0.7%, chose not to reveal their gender. This highlights the need to honour people's desire for privacy and self-identification. Asongu, Amankwah-Amoah, Nting and and Afrifa, (2021:120-133) observed that whilst women comprise of 52% of the national population, only 38% of women are in the ICT sector. These figures relate to positions along the organizational structures and may not refer specifically to management or supervisory positions in the stated organisations. The number of females registering for degree qualifications are equally low at 32% of the student population completing ICT degrees (Omotoso, Adesina and Adewole, 2020: 85). Generally, the percentage of women in middle management stood at 45% in 2019 and 46.1% in 2023, with men comprising of the larger part of the population distribution (Musetsho, Isac and Dobrin, 2021:70-81). The responses may be

representative of the population distribution with consideration of the enrolment of women into the ICT discipline.

5.3.3 Which age category do you fall under?

The data shown in Figure 5.3 demonstrate a heterogeneous distribution across different age groups, indicating a wide variety of career phases and degrees of experience among the individuals polled. This highlights the need to acknowledge and adapt to the distinct viewpoints and requirements linked to various age groups in professional settings.
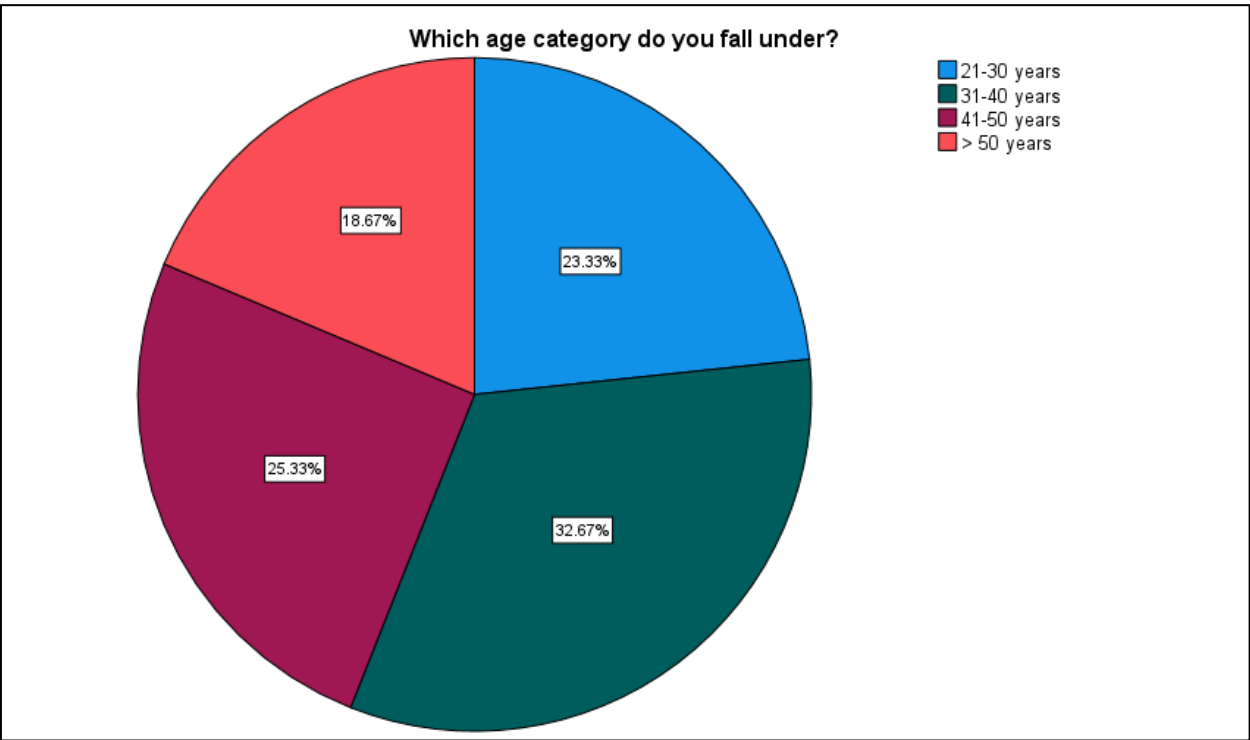
Figure 5.3: Which age category do you fall under?

An analysis of the age demographics of the questioned group reveals a wide variety of age groups. The majority of respondents, accounting for 32.7%, belong to the age group of 31–40 years, suggesting a substantial representation of persons in their most productive years for professional development. The age range of 41–50 years comprises 25.3% of the respondents, indicating a considerable proportion of persons in the mid-career stage who are likely to possess extensive professional experience and knowledge. In addition, the age group of 21–30 years comprises 23.3% of the questioned population,

indicating a significant presence of young professionals who are either joining or establishing themselves in the workforce. Furthermore, the data reveals that individuals aged 50 and beyond constitute 18.7% of the sample, suggesting that experienced professionals continue to participate actively and contribute to the studied community.

5.3.4 Which of the following industries are you involved in?

The data shown in Figure 5.4 illustrate a heterogeneous distribution among industries, emphasising the wide array of areas in which the questioned population is engaged. This variety highlights the complex and varied professional backgrounds and emphasises the need of acknowledging and adapting to the distinct problems and possibilities linked to various industrial sectors.
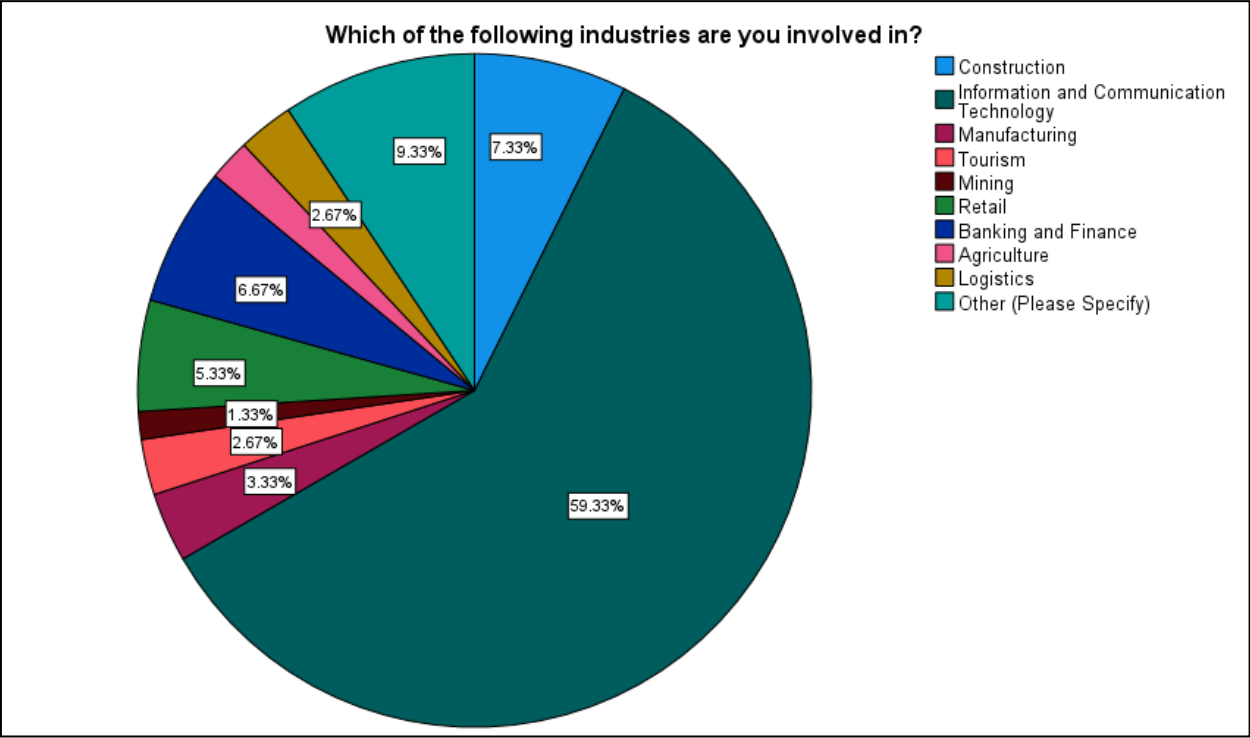
Figure 5.4: Which of the following industries are you involved in?

Examining the allocation of industries among the questioned population reveals a wide range of sectors represented. The Information and Communication Technology (ICT) sector stands out as the most dominant, with 59.3% of participants stating their involvement. This suggests a substantial presence of persons working in technology-related industries. Within the sample, Banking and Finance, in conjunction with ICT,

accounts for 6.7% of the total, indicating a significant presence in the financial services sector. Meanwhile, the Construction, Retail, and Logistics sectors each contribute lesser but significant proportions of the studied population, demonstrating the range of industries included. In addition, respondents from the Manufacturing, Tourism, Mining, and Agriculture sectors jointly contribute to the industrial landscape, although each sector represents a comparatively lower fraction of the sample. A significant proportion of participants, up to 9.3%, belong to the other category, which suggests their engagement in sectors that were not expressly included in the survey choices. This highlights the wide range of industries included in the questioned group.

5.4 Section B the Likert scale

The Likert scale was used to collect data on the perceptions, views or attitudes of the respondents towards leadership and the expectations. The ranking of the scale was on 1 to 5; 1 = strongly disagree, 2 = disagree, 3 = neutral or indifferent, 4 = agree and 5 strongly agree. In this data interpretation, the those strongly disagreeing and those disagreeing are put together (sum total) of those disagreeing. The same is done for those agreeing and strongly agreeing, the sum total of the two is also used to indicate the views, perceptions, etc that were being measured. Each item was therefore responded to one by one following the order as detailed in the questionnaire.

STATEMENT 1: Ability to pay attention and comprehend teams' input

Listening skills have been identified as critical competencies for effective leadership (Van Quaquebeke and Felps, 2018:5-27). This view concurs with the findings of Brink and Costigan (2023: 101581) who observed that good listeners as leaders tend to make better- and well-informed decisions which take into consideration their followership. The respondents' views are illustrated in figure 5.0 below

Figure 5.5 Listening skills as leadership quality

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
■ Percentage	2.00%	0.00%	1.00%	44.00%	53.00%	100.00%

■ Percentage
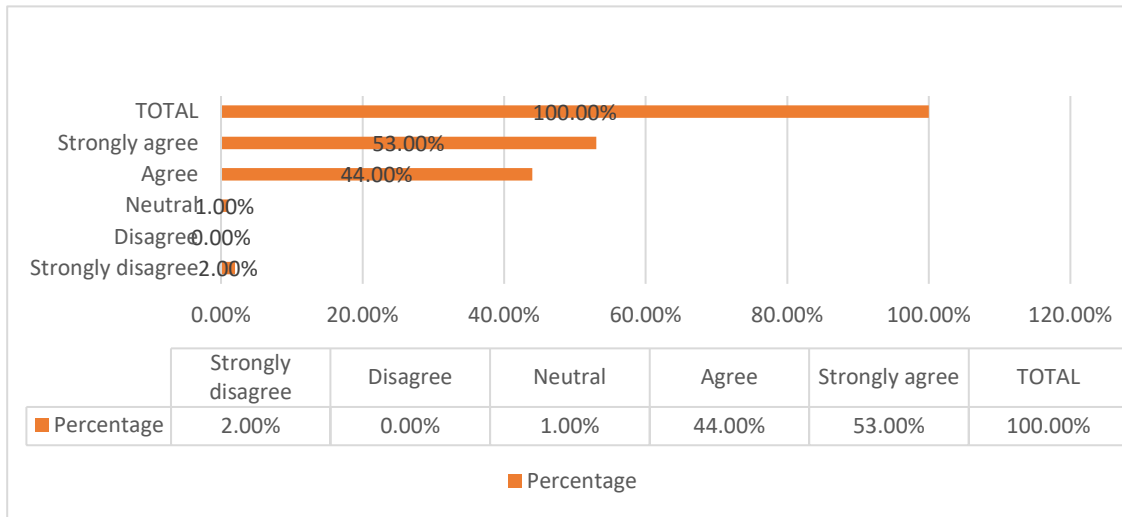
SOURCE: own construction

STATEMENT 2: **The use of feedback and exchange of information.**

Leadership is about communicating and considering that theproject leader will be dealing with human beings who can talk, think, share views and make requests for which feedback is important (Hickman and Akdere, 2018:1-9). Communication is a critical; aspect of the project leader's function, with researchers estimating that a leader / manager spends 80% of their time (their work) communicating (Fadzil and Listyanti, 2024:1428-1433). The thinking of the respondents is reported diagrammatically in figure 5.6 below.

Figure 5.6 Feedback and importance in project execution

Figure 5.6 Feedback and importance in project execution
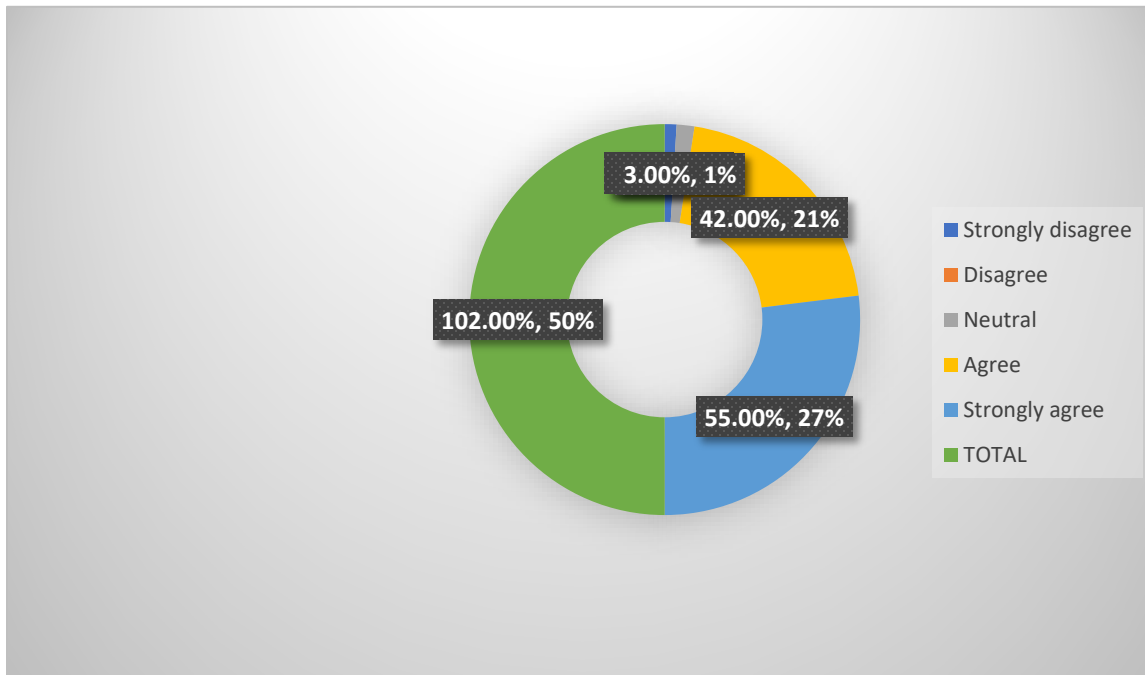
SOURCE: own construction

As in the previous statement, 97% respondents were in agreement with the statement indicating that feedback (part of communication) is essential for effective leadership. This allows for generalisation, leading to concluding that feedback is important in the execution of projects. This may be extended to include all forms of leadership regardless of discipline.

STATEMENT 3 **Interaction at various levels of the project organisational structures.**

One of the ten (10) project knowledge management areas is the need for the project executor to Integrate Project Execution processes taking place simultaneous in different Work Breakdown Structures (WBS). For this to be effective, according to the PMBOK (2017) it requires the project leader to integrate the different WBS leaders across the length and breath of the project itself. Yilmaz, Kumar, Hada, Demirkesen, Zhang and Li, (2024: 1-15) assert that the ability to integrate is a direct end product for the effective interaction by the project leader and the project practitioners. The respondents had this to say as reported in the diagram (figure 5.7) below.

Figure 5.7 Interaction as a project leader competency
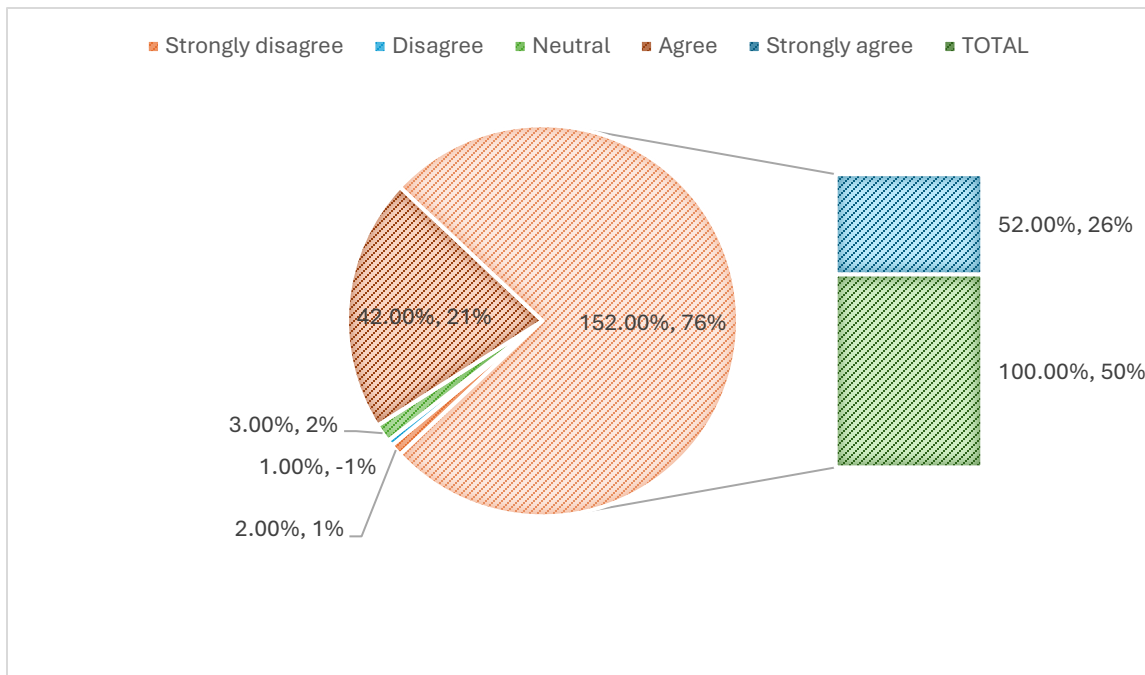
SOURCE: own construction

The majority of the respondents totalling 95% (43% agreeing and 52% strongly agreeing) think of interaction as a critical element of effective project execution leadership in agreement with the existing literature. Shayan, Pyung Kim and Tam (2022:379-386) refer to the ability of a project leader (construction) to interact as a critical and indispensable competency. It can be generalized, and as supported by the findings from the respondents, that interaction is critical for the success of execution of projects.

STATEMENT 4: Communication with all stakeholders

Communication and stakeholder management are part of the ten (10) project management knowledge areas. Communication is the exchanging of messages (sending and receiving) experienced in the process of exchanging information be it verbal, oral or in writing (Hancock, Naaman and Levy, 2020: 89-100). A stakeholder on the other hand is defined as an individual or organisation that has interest in the project or will be affected by the failure or success of the project execution process (Kujala, Sachs, Leinonen, Heikkinen and Laude, 2022: 1136-1196). From the definition there are both internal and external stakeholders, of which the respondents are internal stakeholders. The respondents from these practitioners is illustrated in in figure 5.8 below.

Figure 5.8 Communication with stakeholders
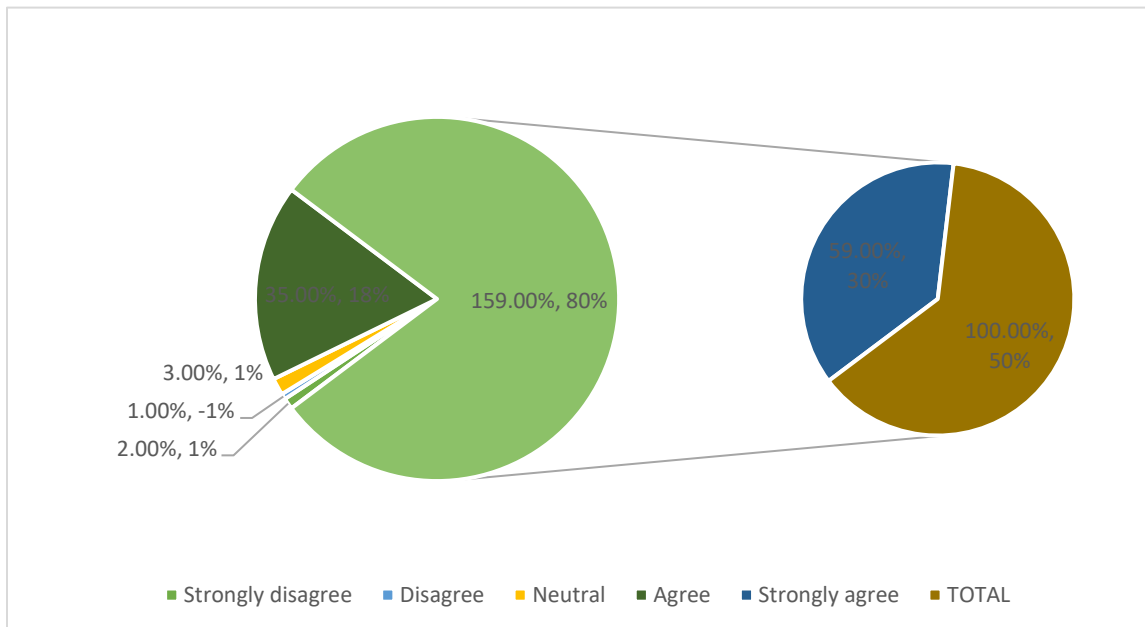
SOURCE: own construction

There should be realization amongst the respondents that shareholders are important and there is a need for considering them as indicated by 94% who agreed. Stakeholders are critical for the success of any project, and to successfully execute a project, there is a need for proper identification of who the stakeholders are and the role they play (Mysore, Kirytopoulos, Ahn and Ma, 2021:445-471). Maqbool, Rashid and Ashfaq, (2022:1542-1561) posit that the greater part of the project execution failure is attributed to failure to effectively manage stakeholders, be they internal and external

STATEMENT 5 Ability to evaluate and set objectives.

The ability to identify and communicate set project objects is an imperative for all leaders, with specific emphasis on project leaders. The project objectives are measurable, specific and time bound goals and aims of the end product as stated with a clear direction for the project practitioners and the stakeholders in general **(**Hamburger, 2019:33-42.**).** The ability of the project leader to communicate the vision and the project objectives will enable the project to motivate the practitioners towards the intended goals within the specified period, budget and quality **(**Zighan, 2020: 240-259.**).** With this in mind the respondents provided the information in the figure 5.9 belo**w.**

Figure 5.9 Importance of ability to evaluate set project objectives

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
Percentage	2.00%	1.00%	3.00%	49.00%	45.00%	100.00%
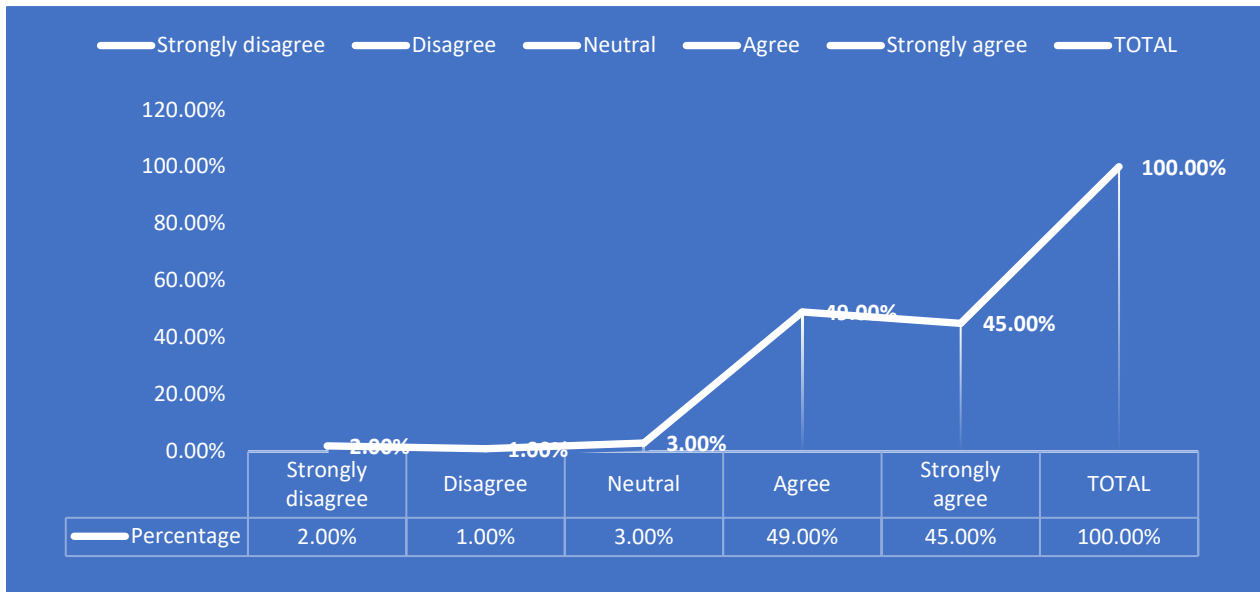
SOURCE: own construction

Those in agreement with the statement (agree – 49%) and those strongly agreeing (45%) equal a total of 94% suggesting that practitioners agree in the main importance of evaluating and communicating the set objectives. Zighan (2020:240-259) asserts that the levels of knowledge about the objectives and their impact on team motivation and performance is critical in the building of synergy amongst project team members. The respondents' data allow for a generalization about the importance of clear set and stated objectives for the project.

STATEMENT 6 Involvement of team members in the establishment of cost baseline.

Successful project execution is defined as the ability for the project team to accomplish or complete the project product within the triple constraints of budget, quality and time (Richardson, Marion Jr, Anantatmula and Gibson, 2022:101**)**. If any one of them is not attained (within the iron triangle) the project is considered as a failed undertaking. The achievement of this goal is based on the people who are involved as projects are executed by people. The respondents' views about involvement of team members are recorded in figure 5.10 below.

Figure 5.10 Involvement of team members in cost baseline determination

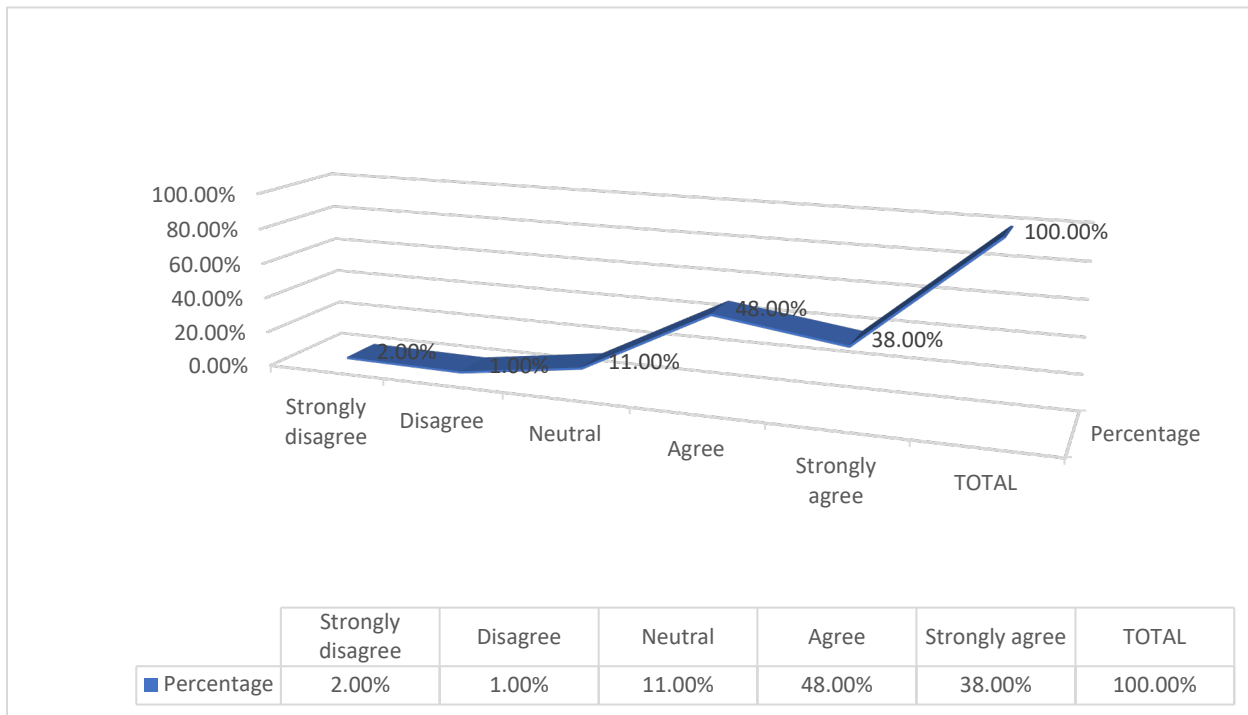|	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
Percentage	1.00%	5.00%	16.00%	47.00%	31.00%	100.00%
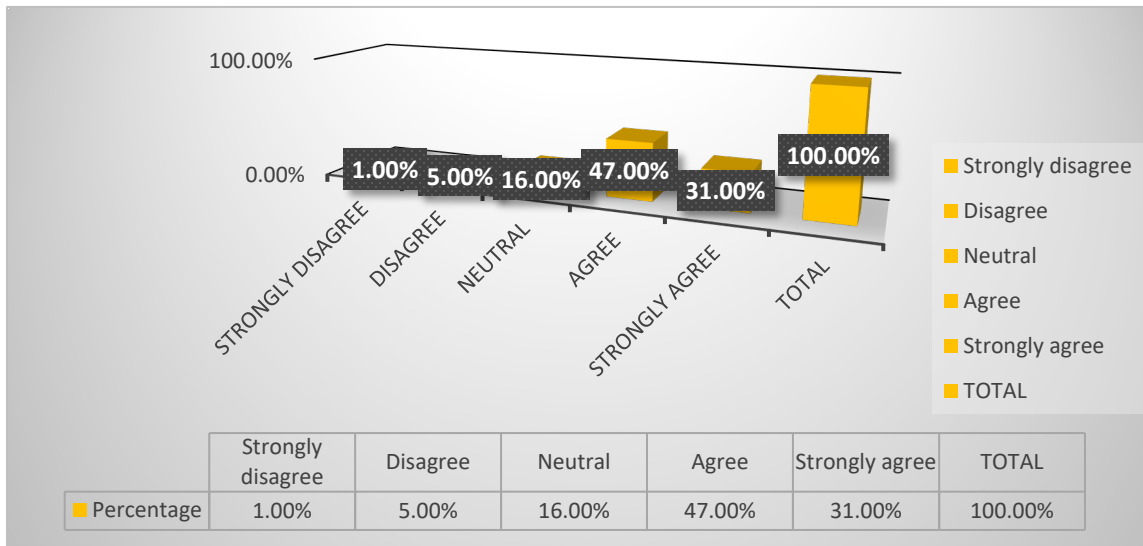
SOURCE: own construction

Neutral is high at 16%, but those in agreement with the involvement of team members have a combined agreement at 78%. Literature makes reference to the 4 Ps of project management which are the planning, the processes, the people involved, and the power involved (line of authority) as critical for effective project execution (Nygård, Wondimu and Lædre, 2019:109-120). In a separate study on employee motivation to perform, Jowah and Beretu (2019:264-273) established that there is a relationship between involving employees (in this case, project team members) and the level of engagement in the performance of their tasks. The responses agree with current literature on this statement, the more engaged the employees are the higher the chances are of having successful project execution success.

STATEMENT 7 The use of action strategies

Action strategy is defined as a "**pl**an of action" to be adopted in the future to achieve the set objectives (goals) which is used to identify and prioritize resources, tasks to be performed and decisions to be made **(**Cohen, Loeb, Miller and Wyckoff, 2020:134-160**).** This is represented as a layout of the tasks to be performed to achieve the intended goals or objectives, it is a breakdown of the processes to be followed to accomplish the actionable timeline and tasks. The responses are illustrated in figure 5.11 below.

Figure 5.11 Use of action strategies

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
■ Percentage	2.00%	1.00%	11.00%	48.00%	38.00%	100.00%

SOURCE: own construction

The respondents giving a positive (agreeing 48% and strongly agreeing 38%) totalled 86%, allowing for a generalisation and agreement with the statement. Neutral is slightly high at 11%, but too low to cause concern. Bunger, *et al* (2017:1-12) posits that when action strategies are properly made, and the tracking (monitoring and evaluation) should assist in providing a practical approach to the achievement of the objectives. This was confirmed from the responses from the project practitioners.

STATEMENT 8. Continuous attention to technical excellence and good design.

Quality is a critical element of successful execution of a project, as listed on the triple constraints or iron triangle used to determine successful execution. For the effective management of the technical aspects of a project there is need for constant monitoring and evaluation of the execution of the processes and the tasks. Monitoring and evaluation is the assessment of performance and effectiveness of the operations in relation to the set objectives (Okafor, 2021:34-49). The respondents gave their views on this statement as illustrated in figure 5.12

Figure 5.12 Continuous attention to technical excellence and good design

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
▪ Percentage	2.00%	1.00%	18.00%	40.00%	39.00%	100.00%

Percentage
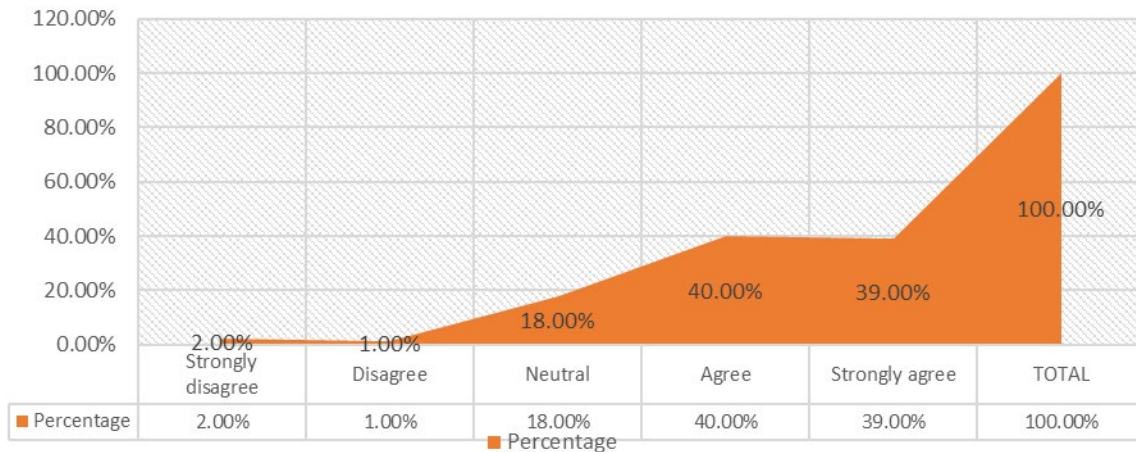
SOURCE: own construction

Neutral went up slightly more to 18%, it is not clear why this increase, and this could be because they do not know or they are simply indifference. Simultaneously those in agreement (40% agree and 39% strongly agree) have inevitably come down to a total of 79%, but still large enough to allow for generalization. Rumenya and Kisimbi (2020:46-66) emphasise the critical role played by monitoring and evaluation in successful execution, they suggest most project execution failures are a result of poor monitoring and evaluation during execution.

STATEMENT 9 Ability to negotiate with other departments or functional structures.

Jowah (2014:130-144) submitted that the effectiveness of a project leader will go beyond the project team and managing their performance, but that there is political influence needed in dealing with other managers outside of the project team. Negotiation is a critical skill for project leaders who have to liaise with leaders of other departments if execution is to be successful (Ningsih, Ariani, Sagala and Harahap, 2022:2519-2533). The respondents expressed their experiences as illustrated in figure 5.13 below.

Figure 5.13 Importance of ability to negotiate

|	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
■ Percentage	3.00%	2.00%	10.00%	40.00%	45.00%	100.00%

■ Percentage
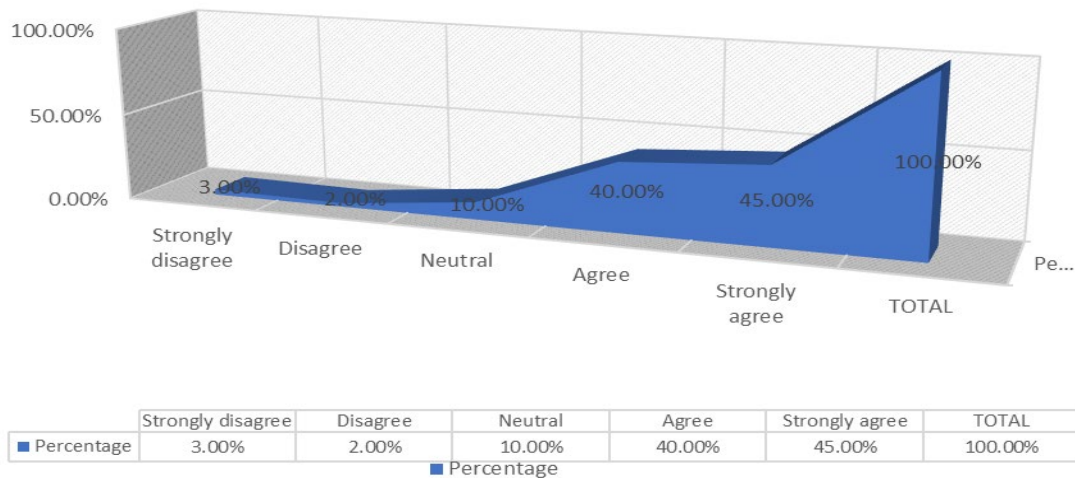
SOURCE: own construction

Neutral went down slightly at 10% suggesting more project practitioners do not doubt the importance of negotiation as a critical aspect of effective project execution. Those in agreement (40% agree and 45% strongly agree) total 85% of the total participating in the research and this allows for generalisation. It is however in agreement with literature that speaks to the absence of authority gap specifically in projects that are embedded in the matrix of organisations **(**Mazibuko, Tait and Jowah, 2015:313-335**).**

STATEMENT10. Communication of goals across the project team.

Communication is one of the 10 project management knowledge areas and is the "glue that puts together all the operations" of a project. Primarily involved in the transference of information between the WBSs and the individuals in the project processes (Project Management Institute, 2021:123-145). Be they internal and external it plays a critical role in keeping all project practitioners informed about the activities, the progress, the problem and solutions prescribed. The project practitioners expressed their views about this knowledge area as shown in figure 5.14 below.

Figure 5.14 Communication as a factor in project execution
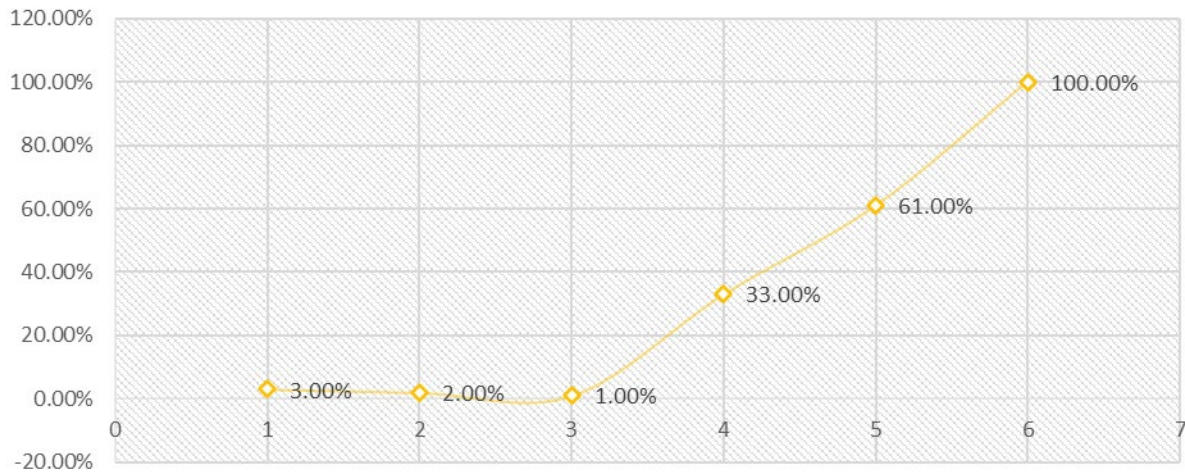
SOURCE: own construction

Neutral came down to 1%, it is not clear even why there would be a practitioner who does not understand the importance of this project execution aspect. However 94% of the respondents (combined) agreed with the statement allowing a generalisation, which is in agreement with current literature on projects. Shayan, Pyung Kim and Tam (2022:379-386) suggest that the highest cause for project execution failure rate is as a result of poor communication. This is confirmed by the inclusion of communication as a critical competency necessary for the effective execution of any project undertaking (Shaqour, 2022:101509).

STATEMENT 11 Ability to welcome changing requirements, even late in development.

Too often project plans (project charters) may need to be changed if the customer's needs or situations alter, or sometimes better material may be difficult to procure in the market (Butler, Vijayasarathy and Roberts, 2020:262-277). The change may also be necessity of a likely better material or option for the customer or the project team, this has an impact on the project as a whole, but what is the preparedness of the project leader to change? The respondents' suggestions are shown below.

Figure 5.15 Willingness to change scope by project leader
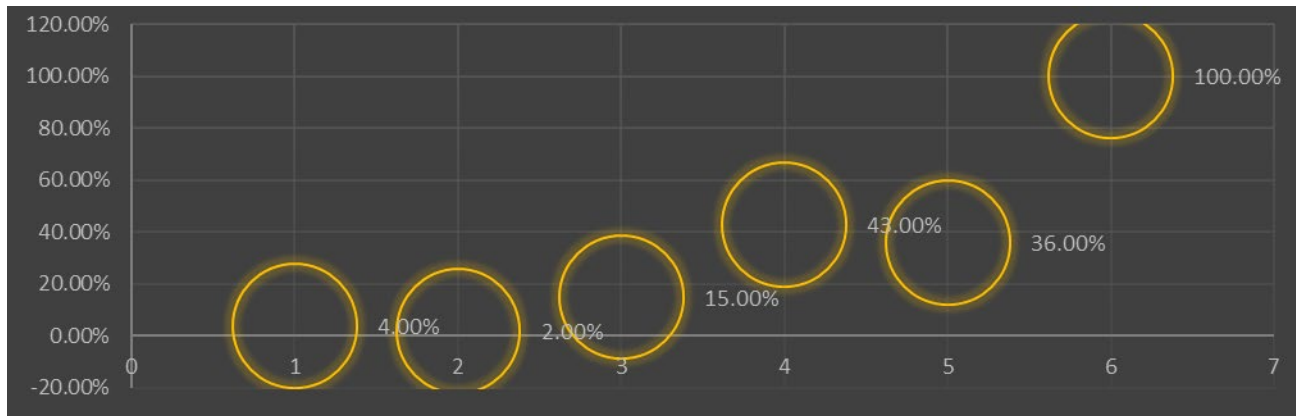
The majority of the respondents are of the view that if changes are to be effected for the existing plan it is important that the project leader be willing to, as indicated by 79% of the respondens on the affirmative. Whilst those who disagree have remained low through out the study, the indifferent went up to 15%, but not significant enough to affect the generalization as submitted by those in agreement. Ajmal, Khan, Gunasekaran and Helo (2022:2786-2809) consider the willingness and ability to manage scope creep as a critical competency for project leaders.

STATEMENT 12. Evaluation of performance.

Performance in a project may be considered in two different ways, and these could be the performance of those executing the project tasks from the different WBSs, or merely the overall performance (being on track) as can be indicated by constantly monitoring and evaluation the progression in the different project phases. Ibrahim, Zayed and Lafhaj (2024:1988) are of the view that good project leaders should keep evaluating their project practitioners to confirm their ability to maintain the required standard to meet the project requirements. In response to this statement, those participating in the survey expressed their views as illustrated in figure 5.16 below.

Figure 5.16 Evaluation of performance
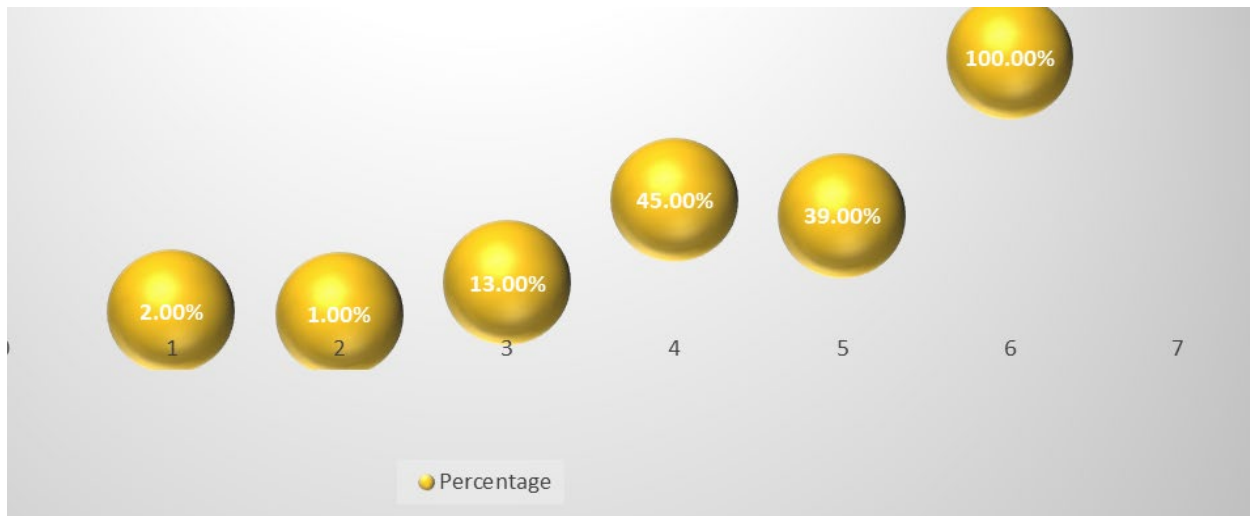
SOURCE: own construction

Another neutral level that cannot be understood, and this time it sits at 13%, this is however countered by those who responded in the affirmative. A majority of combined agree (45%) and strongly agree (39%) adding up to a total of 84% comparable to the figure above, agreed with the statement. Rehman, Shahzad, Farooq and Javaid (2020:38-47) assert that constant performance management by a project leader enables easy assessment of the likelihood of the project execution succeeding or failing to meet the goals. Performance management may mean that the project leader wants a successful execution process for the project at hand.

STATEMENT 13. Observing work progress actively.

There is a seeming relationship between regularly observing the tasks performed against the extend to which performance has gone, and the type of decisions undertaken by the team. Ramachandran and Karthick (2019:2278-3075) identify a Gantt chart as a critical tool that can be used to measure overall performance of both the project processes as well the individuals to whom specific tasks with stipulated time limit are to be performed and completed. Basing on their experience and exposure to these processes the views of the project practitioners are shown in figure 5.17

Figure 5.17 Active observation of project progress.
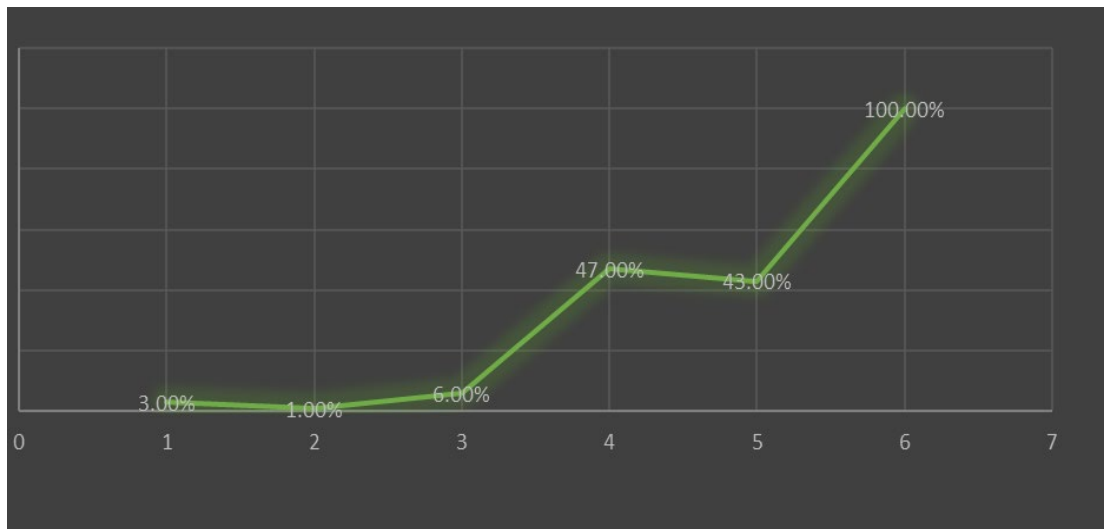
SOURCE: own construction

A total of 90% of the practitioners were of the view that it is important to actively observe (monitor and evaluate) the execution processes. Considering that a project has five phases that it passes through, it is only convenient and proper that the transition from one phase to another be actively monitored. Sharon and Dori (2017:447-466) confirm the need for constantly watching (observing) the activities from phase to phase as there is changes in requirements, the stakeholders and resources needed for effectively executing the project.

STATEMENT 14. Ability to develop other people.

One of the major characteristics of transformational leadership is people and empowerment, normally experienced through the provision of learning and allowing for errors (Adamy, Lumbanraja, Lubis and Siahaan, 2018:330-337). This view is shared by Schermuly and Meyer (2020:740-752) who assert that empowerment leads to employee engagement, inspiration and motivation to perform. This is also associated with emotional intelligence (EQ) which is considered a critical feature in all effective leaders. The respondents had this to say, figure 5.18

Figure 5.18 Ability to develop others
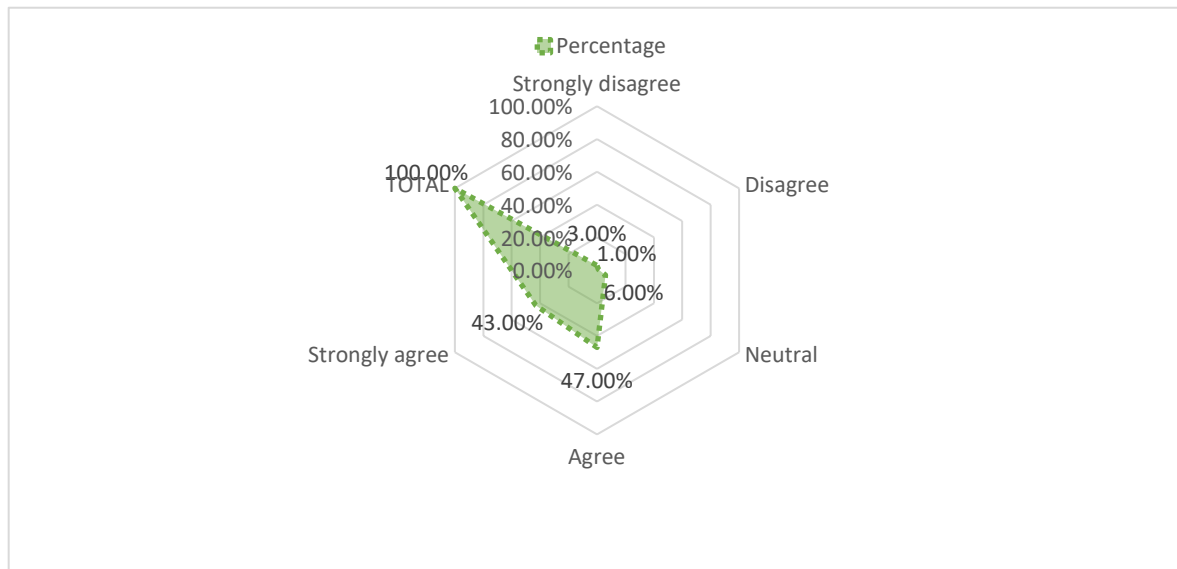
SOURCE: own construction

The majority of the respondents (total 90%) agreed that one of the characteristics of an effective project leader is to empower or develop other people within the system. When employees are empowered through training and learning new skills, they tend to show more loyalty, willingness to work and show high levels of job satisfaction (Khaliq, Kayani and Mir, 2020:185-198).

STATEMENT 15. Clarity of vision and ability to share it with others.

A vision statement states or informs the stakeholders what should be done and where should this end (Gregory, 2023:95-102). This clarity of where the project is going gives the practitioners a purpose for them to perform the tasks knowing what the end product should look like. This on its own does provide motivation and enables the practitioners to work towards achievement of specific milestones as evidence that they are making progress (Windo and Sugiyanto, 2024:743-756). In this survey, this is what the respondents said as put in figure 5.19.

Figure 5.19 Clarity of vision and performance
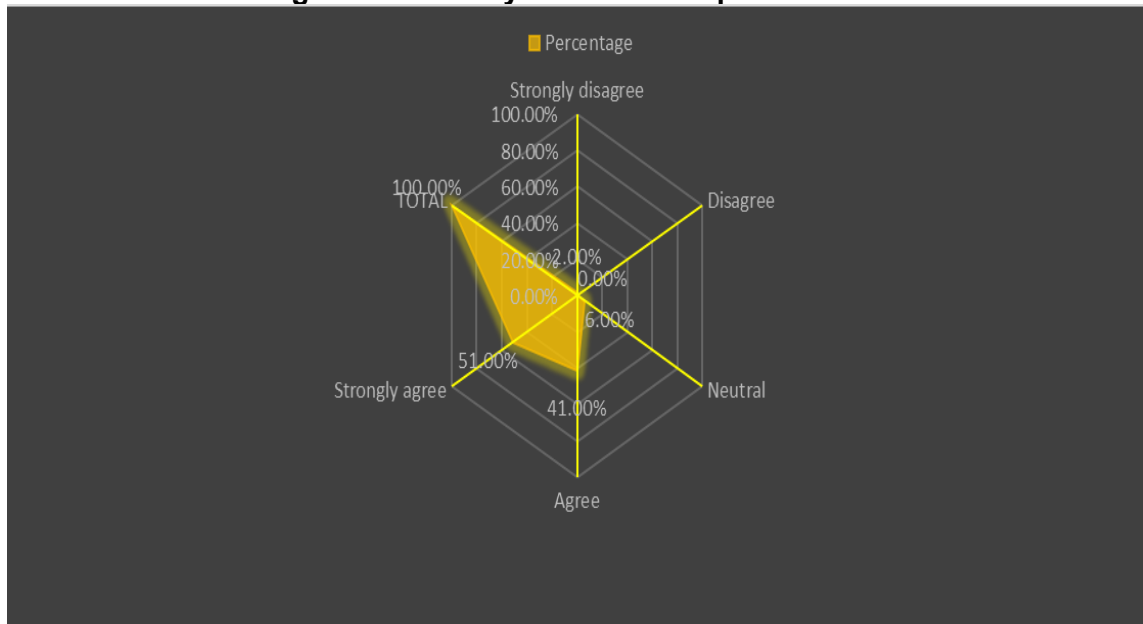
SOURCE: own construction

The respondents to the survey were of the decided view that the vision clarity has an impact on performance or at least does motivate employees to perform with 92% in agreement. This agrees with current literature speaking to the clarity of a vision as a motivating factor for practitioners **(**Hamstra and Yamazaki, 2021:75-80**).**

STATEMENT 16. Ability to empower team members to get the job done

Too often not all project team members know exactly what is to be done or how cit should be done, this may be lack of specific technical expertise or changes in the technology or techniques used. Changes in technology may required extra training, which on its own is empowering and thus motivates the project practitioners to learn more, become motivated and perform better. The respondents shared their views on this matter as illustrated in figure 5.20 below.

Figure 5.20 The empowerment of project team members and resultant performance.
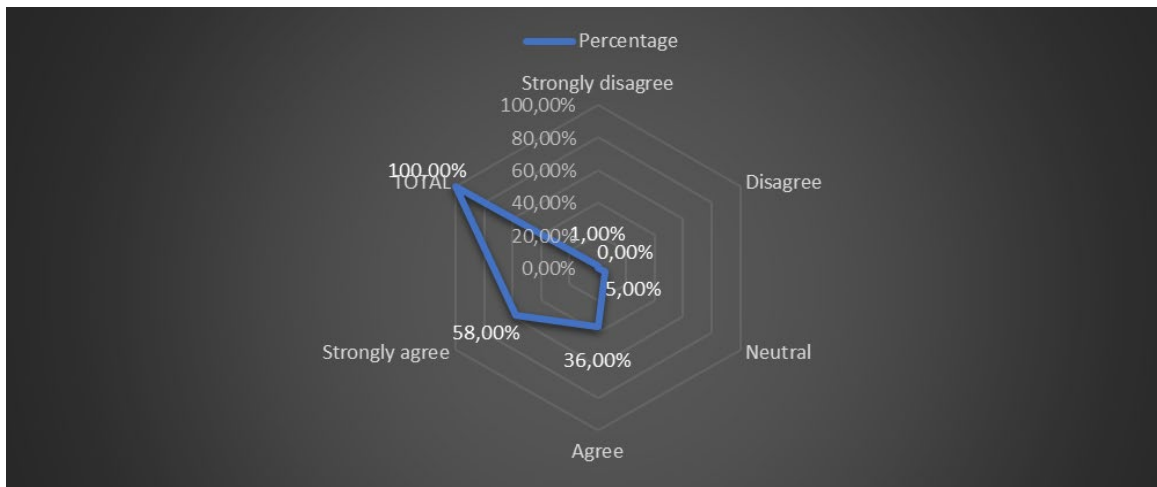
SOURCE: own construction

An overwhelming majority of the respondents agreed with the statement (36% agreed and 58% strongly agreed) making a total of 94%, which allows for a generalisation. This too is in agreement with the literature on the subject of motivation, with Rahmi, Achmad and Adhimursandi, (2020: 8-14) suggesting that empowerment of project practitioners has a direct impact on how they work. Generally when they are empowered by getting training, or allowing them a degree of decision making they tend to show high levels of job satisfaction and performance **(**Mbebe and Jowah, 2024. 1-8**).**

STATEMENT 17. Strong focus on priorities.

Priorities may be defined as those activities or tasks that are critical for the process and generally tend to allow for the subsequent performance of the other activities (Meredith and Mantel, 2017). It is good management to identify and procure the expertise for performing certain tasks and get certain materials necessary for the execution before the execution starts. It is common knowledge that to be effective the project needs to identify, procure and align all thenecessary resources. The responsents shared their views in the figure 5.21 below.

Figure 5.21 Focus on priorities

Chart Title

■ Increase ■ Decrease ■ Total

					100.00%
				53.00%	
			41.00%		
2.00%	1.00%	3.00%			
Strongly disagree	Disagree	Neutral	Agree	Strongly agree	TOTAL
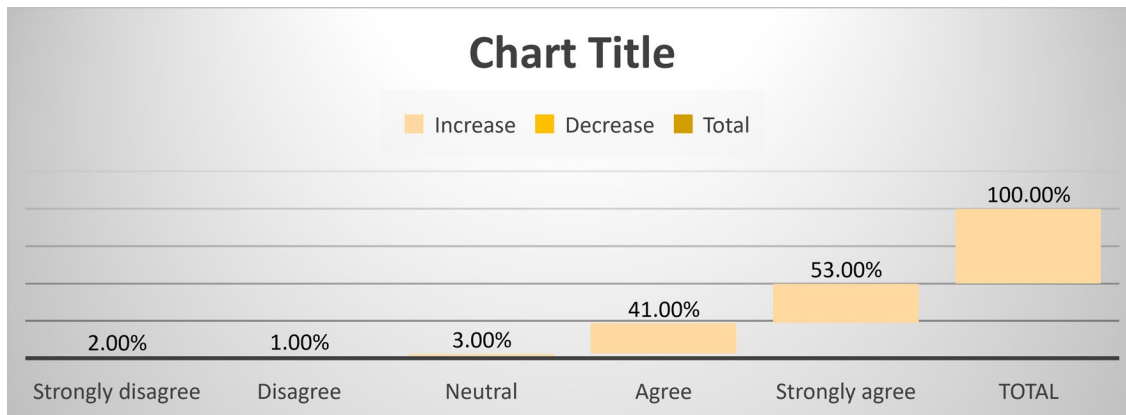
SOURCE: own construction

Another high of 94% agreeing with the statement (41% agreed and 53% strongly agreed) making it possible to generalize on the importance of management by prioritization. In as much as it is common knowledge, researchers have put this as an important competency for management. Anantatmula V.S (2010) posit that a project leader who involves the project team in the decision making enables the team members to suggest what would be priority, thus enabling them to work better with clarity of important issues.

STATEMENT 18 Clear standards of ethics on integrity, openness and honesty

Ethics (moral philosophy) focuses on moral phenomena as a branch of philosophy investigating the principles governing moral evaluation, character and conduct (Chamtitigul and Li, 2021: 240-259). This is based on what people consider as right or wrong, which may be difficult to determine because of differences in the value systems that individuals have. The respondents shared their views as reported in figure 5.22 below.

Figure 5.22 Ethical leadership and integrity
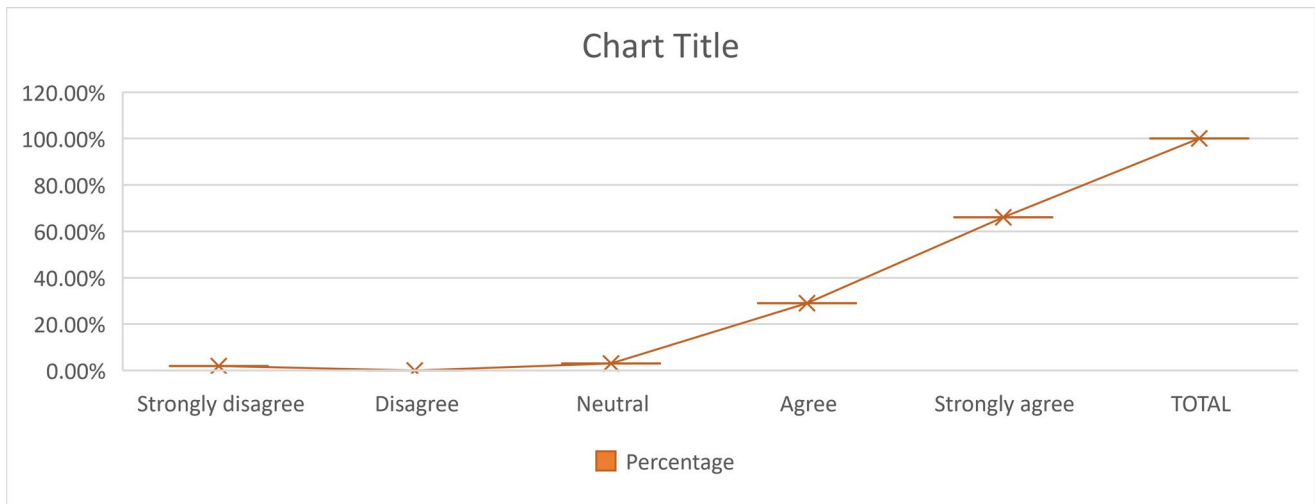
SOURCE own construction

It appears that ethics and integrity is considered seriously by the respondents in 29% (agreeing) and 67% (strongly agreeing) totalled 96% in support of the statement. Ethics is a critical issue in the development of relations between individuals and teams, let alone the desire for an ethical leader (Bhatti, Kiyani, Dust and Zakariya, 2021:982-998)**.** Acceptable ethical conduct by team members attracts loyalty and good relationship with the practitioners, suggesting the importance of acceptability.

STATEMENT19. Establish a sense of urgency in teams.

Literature makes reference to the need for the project leader to develop a sense of urgency in the project team as this enables them to work with a purpose. Some of the technics used to create the urgency will be defining of the vision and the values used to communicate a clear direction for the team (Mitcheltree, 2023:11), this should be supported by the setting of SMART goals, milestones, celebration of success team empowerment, effective and frequent communication and promptly correcting failures or weaknesses through monitoring and evaluation (Ding, Shen and Wang, 2024:448.). The respondents, as project practitioners understand this and expressed their views as illustrated in figure 5.23 below**.**

Figure 5.23 Importance of sense of urgency in projects
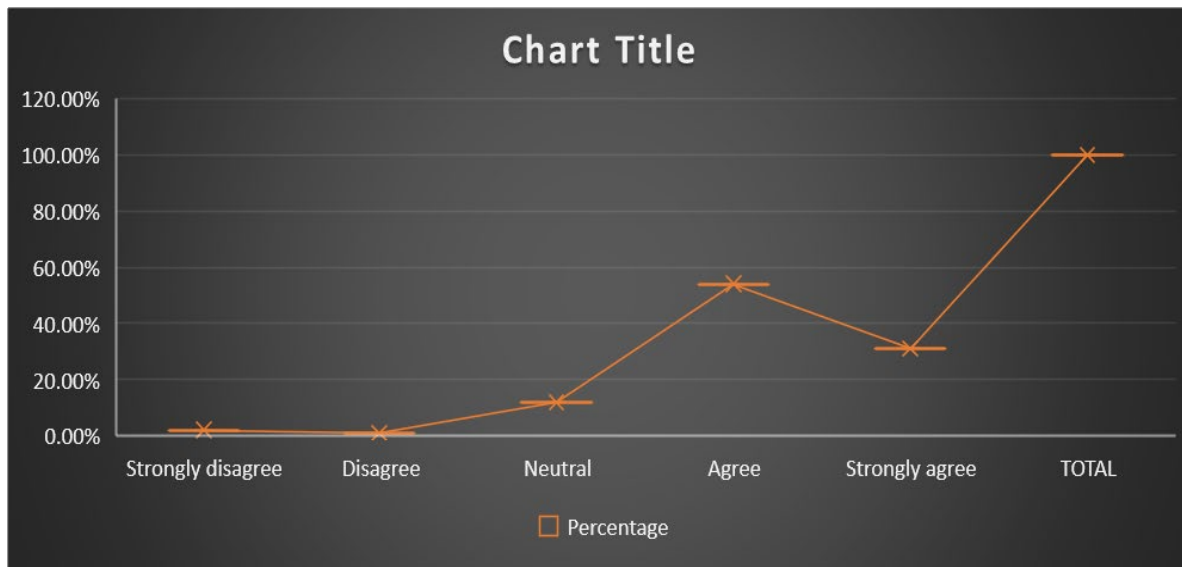
SOURCE: own construction

A total of 84% agree with the statement even though there is a slight increase in the neutral at 12%, generalisation can be made that there is a need for the leader to create a sense of urgency. The sense of urgency through identified milestones enables the workers to work to achieve the set goals and that serves as an incentive for performance by team members (Kalman, Ballard and Aguilar, 2021:153-175). The use of set targets may also indicate a form of transactional leadership where goals and targets are set with clearly defined times within which these need to be completed (Dong, 2023:21-25).

STATEMENT 20. Ability to create a guiding coalition between team members

A project generally have phases which it has to pass through, and these phases are generally divided into five parts and different individuals participate in the different phases (Davis, 2018:38-47). Each phase leads to another phase and the stakeholders and interests change, thereby suggesting the need for a degree of cooperation (coalition - understanding) of what was done leading to what will be done next. The project itself is comprised of different tasks done at different Work Breakdown Structures (WBS) headed by team leader leaders, these different tasks will be combined to form the one complete project product (Kordi, Belayutham and Che Ibrahim, 2021:513-532). There is therefore a need for coalition (bringing together) of team members to enable them to coordinate

their tasks towards the completion (assembling) of the one end product. The integration of these tasks towards the building of one product is one of the project management knowledge areas according to PMBK (2017) In their wisdom the practitioners' responses are detailed in figure 5.23

Figure 5.23 Guiding coalition between team members
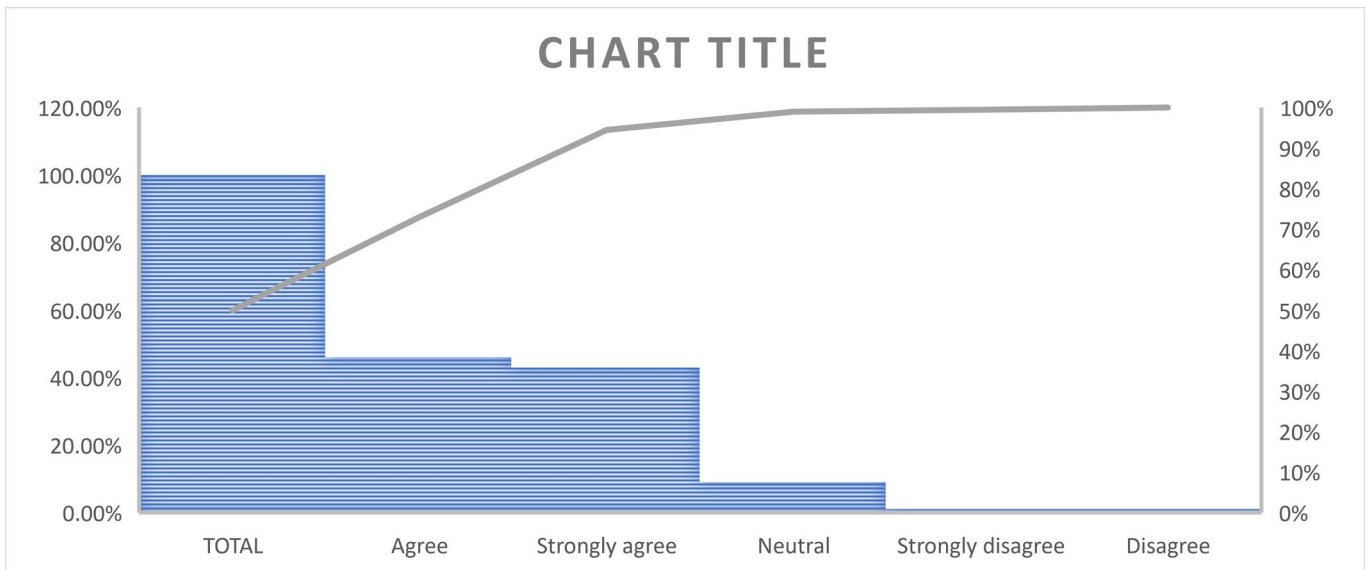
SOURCE: own construction

Project leaders have the responsibility to coordinate and integrate the operations and tasks performed in different parts of the project. Conducting regular inter-departmental (inter WBS) meetings is one way of enabling the individual sub-teams to know what is happening in the other sub-teams. To this, 89% of the respondents agreed with the statement, allowing for a generalisation of the statement that "inter WBS-grand coalitions" are critical for effective project execution.

STATEMENT 21. Ability to develop a clear shared vision

A shared vision can be described best as a collective agreement and understanding by the team members of what aims, goals and objectives of the project are (Mohd Adnan and Valliappan, 2019: 1042-1056). There is a need for the project leadership to coordinate and paint a picture for all the members to look at as the organizational goal or the desired end product of all the activities. This shared vision (understanding of the picture) enables the building of synergy amongst the different groups (sub-teams) and

this unites them in purpose and allows for cooperation and integration (Pongpeng and Ratanawimol, 2024:2754). The respondents shared the same perspectives about the importance of the shared vision, see the illustrations in figure 5.24 below.

Figure 5.24 Leader development of clear shared vision
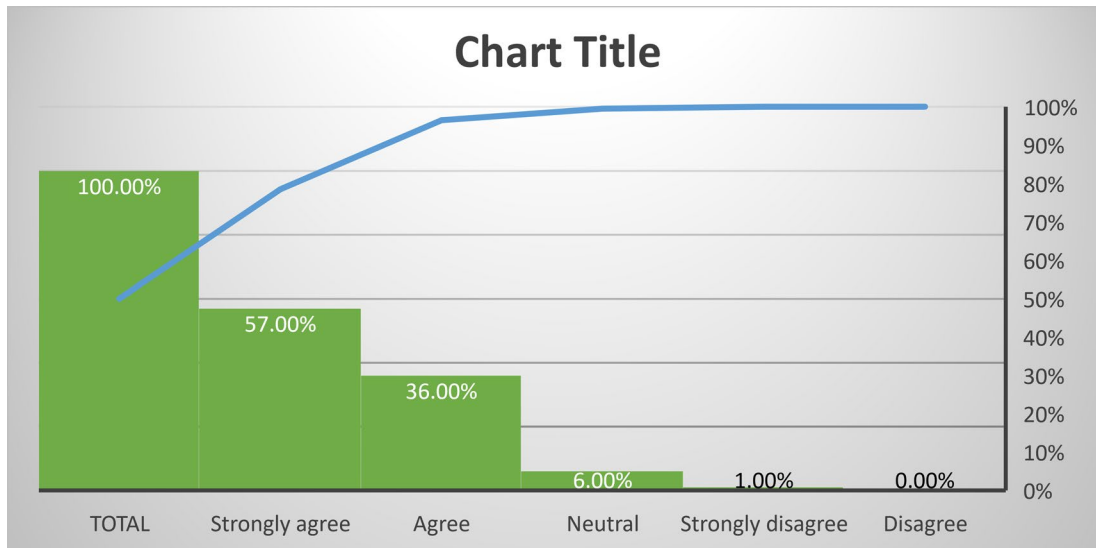
SOURCE: own construction

The importance of a clear shared vision in the projects is realised by the respondents as being of a critical nature using their response, 36% agree and 57% strongly agreed totalling 93% in all. For all practical purposes, this can be used for generalisation, and is in agreement with the existing and or contemporary research as reported in literature. Holt and Aveling (2023:203) established that shared vision enables the sub-teams to realise the importance of interdependency and thus work together to form the necessary cooperation and synergy that allows for motivation towards goal achievement. The presence of a clear shared vision serves as an assurance of a partnership between the different role players in the execution of the project **(**Raftery, Hossain and Palmer, 2022:322-336**).**

STATEMENT 22. Promote communication of a shared vision

It is important for the sub-teams and their members to acknowledge the role played by shared vision in the way they will behave in their task execution processes. The shared vision brings about a sense of togetherness and allows for a symbiotic relationship between the sub-teams which allows for mutual exchange of resources **(**Özcan,

2018:635-648). For this to provide the support needed, there should be a deliberate promotion for the necessary interconnected collaboration for the team members. Communication becomes the tool necessary for the developing of the shared vision as it aligns team members to a specific target and fostering a sense of purpose and unity (Von Jacobi, 2018: 853-876). Effective communication ensures that team members have a uniform understanding of the shared vision and therefore work towards the same goal and purpose. The respondents agreed with the statement, as illustrated in figure 5.25 below.

Figure 5.25 Communication and the shared vision
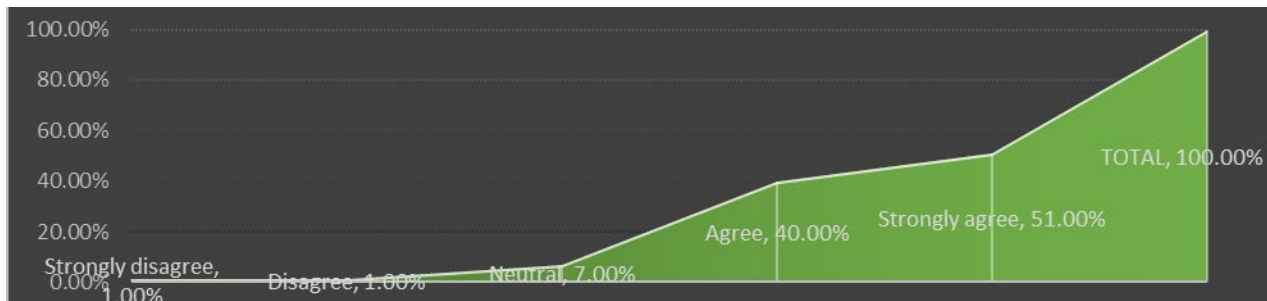
SOURCE: own construction

The respondents indicated that they agree with the statement with 40% agreeing and 51% strongly agreeing to the statement, this totalled 91%. This allowed for the generalisation required to decide. This means therefore that effective communication of the shared vision is necessary to create the symbiotic relationship that may impact positively on the performance of the members as individuals and the sub-teams as units **(**Doten-Snitker, Margherio, Litzler, Ingram and Williams, 2021:206-229)**.**

STATEMENT 23. Empower people to act on the vision.

Empowerment is the extent to which individuals (or teams) have the ability for self-determination and autonomy enabling them to act on their own (Nadeem, Zia-uD-din, Riaz, Shafique and Sattar, 2018:89-94). The need for empowerment would depend on the tasks to be performed (in the context of a job) and would therefore enable people to make decisions for themselves. When people are empowered, it is therefore expected that they are engaged (Jowah and Beretu, 2019: 264-273) and therefore have confidence

in their own operations. Inspiring them with the shared vision will mean therefore that their ability to perform tasks and the understanding of tasks to be performed and the purpose thereof will enable them to perform better (Tampi, Nabella and Sari, 2022: 1620-1628). The respondents said what is recorded in figure 5.26 below.

Figure 5.26 Shared vision and empowerment
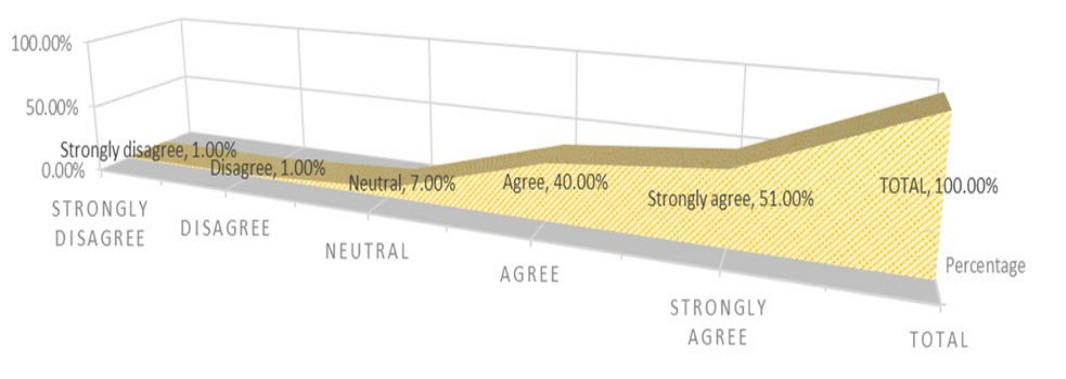
SOURCE: own construction

A total of 91% of the respondents were of the view that when people are empowered they are able to work effectively towards attainment of the shared vision. This total is made up of 44% who agreed and 47% who strongly agreed, and this total allows for generalisation, clearly indicating the importance of a shared vision and empowerment of the practitioners as a positive sign for successful execution (Mohammed and AL-Abrrow, 2023:3532-3552). When individuals (and teams) are made to buy into a vision, and if the vision is within their ethical context, it is expected that they will excel as it is motivating for one to reach those milestones.

STATEMENT 24 Institutionalise the change

This refers to the regulation of the process of societal behaviour within organizations or in reference to the entire community through the establishment of culture or norms (Van Kleef, Gelfand and Jetten, 2019:103-814). This gives a character to an organization which may become structured, and this culture is the norm and the operations are executed within that "norm." Projects are known to be life changing activities (House, et al 2020:20192794) and it should be understood therefore that the project organisations have change is the norm. Figure 5.27 below shows the views of the respondents.

Figure 5.27 Impact of institutionalization of change

Institutionalise the change.		1%	1%	23%	45%	30%
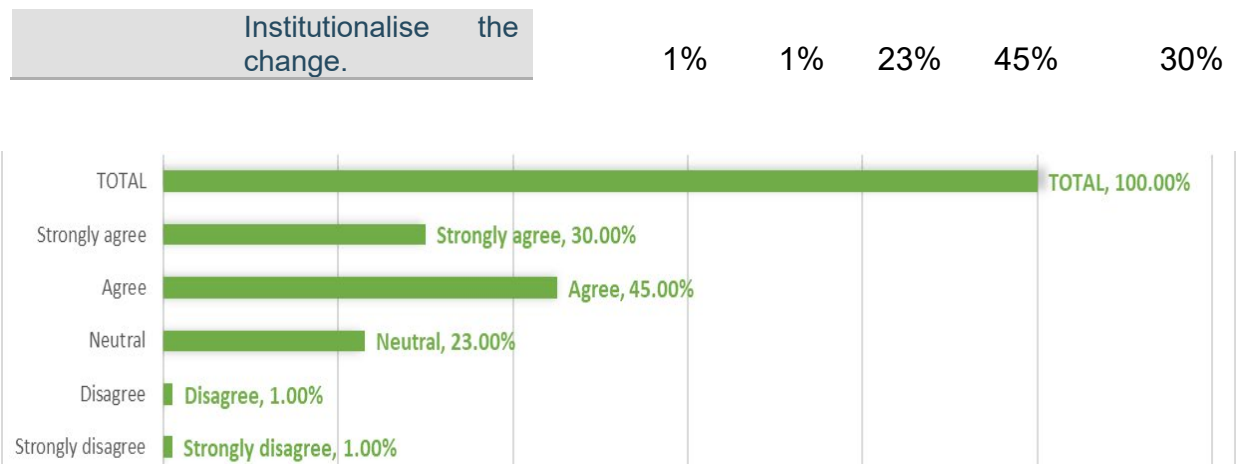
SOURCE: own construction

Neutral is high at 23%, and this is not clear why so many people who be indifferent considering that they are part of the system. However, 75% of the respondents (45% agreed and 30% strongly agreed) in total replied in the affirmative, suggesting the importance of the normalization of the change in the organisation.

STATEMENT 25. Offer support and facilitate others

A thoughtful leader will have concern for the performance of the team and will inevitably keep close and in touch with the team members. Support for the team may involve among other things, standing up for your team, communicating the team member roles clearly, being accessible to the team when needed and by upskilling them wherever necessary (Pavez, Gómez Liu and González, 2022:951-971**).** Spending time with team members when needed cannot be substituted by anything, as the presence of the leader means much in terms of the importance of the work they do. The respondents expressed their views according as shown in figure 5.28 below.

Figure 5.28 Team support
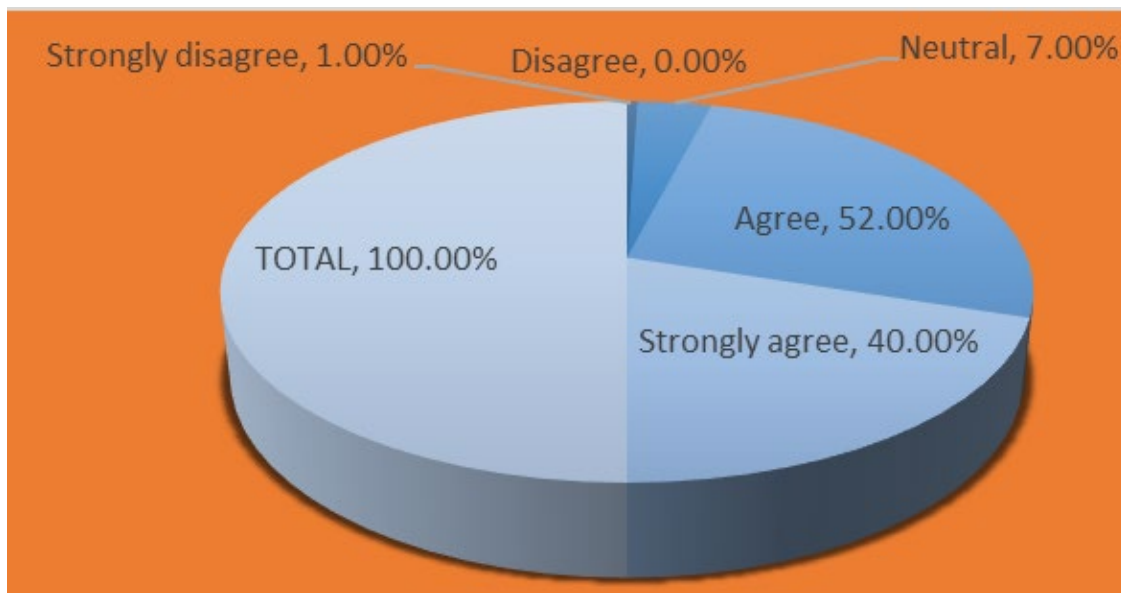
SOURCE; own construction

Those in agreement totalled 92% coming from 52% agree and 40% strongly agree, suggesting that team support by the project leader is considered favourably. This is in agreement with the existing literature, Pavez, Gómez, Liu and González (2022:951-971) measured the effect of team support on the performance and the boosting of the team moral. When the team has support, it helps in bolstering their energy and focus on the purpose and the vision of the project.

STATEMENT 26. Ability to relay critical information to team members. Teams have specific goals they set out to be met, be they in the form of milestones or as individual tasks to be fulfilled, it is important that there should be prioritisation of the goals. For this to take place, the team must identify what is considered critical information on which basis the goals and milestones can be set and be prioritised for achievement (Kerzner, H. 2017). The respondents gave their views as listed in figure 5.29 below.

Figure 5.29 Ability to relay critical information
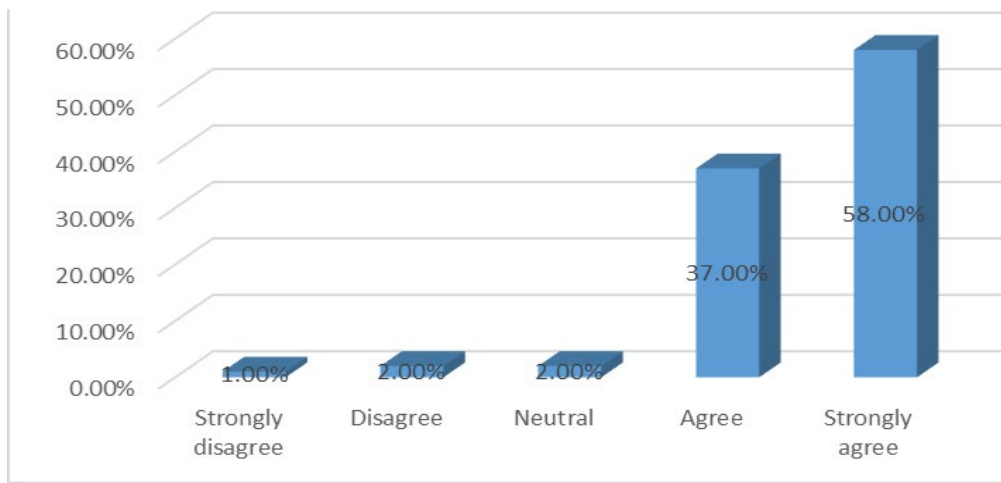
SOURCE: own construction

Neutral is low at 2% whilst those in agreeing (37%) and strongly agreeing (58%) making a total of 95% on the affirmative. This clearly indicates the need for relaying critical information to the team, and this is the importance of effective communication to the teams and across the project. The effectiveness of communication, as alluded to above, means the presence of a highly informed project team which may work with purpose.

STATEMENT 27. Encourage others to learn new skills.

The changes and rapid development of technology mean that there is a continued need for skilling and reskilling of the employees and this positively impacts on team performance **(**Lee, Dewi, Suyasa and Susanto, 2021: 634-641.**).** Methods of teaching may vary according to the situation but the desire to develop and empower people to develop new skills for effective execution of the projects processes. The respondents using their own experiences provided the data in figure 5.30 below.

Figure 5.30 Encouragement of learning of new skills
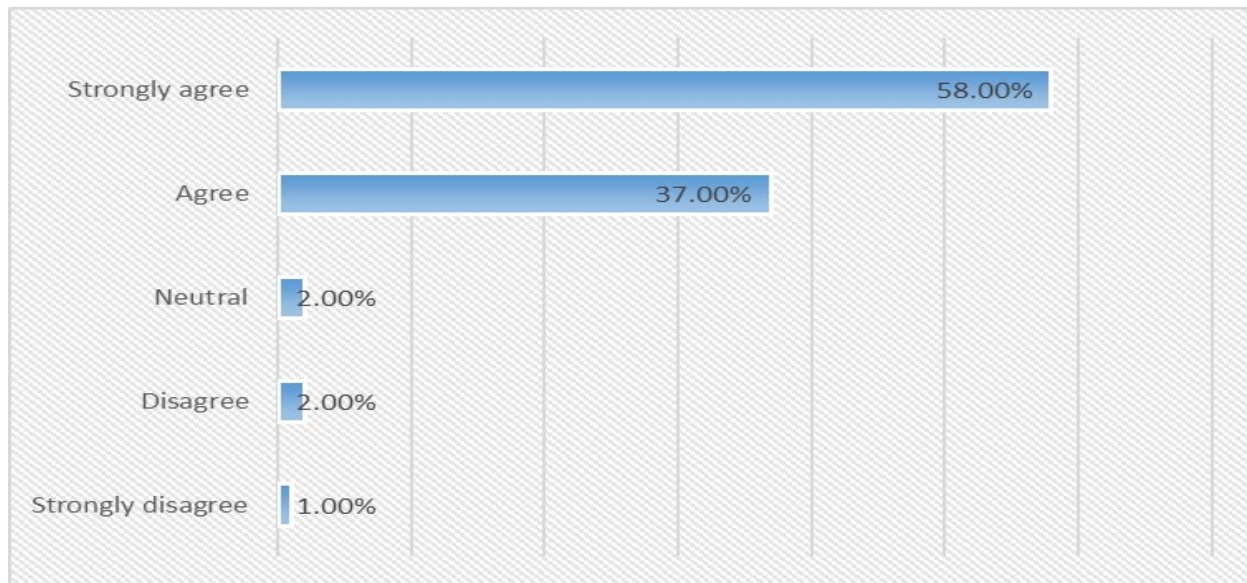
SOURCE: own construction

Neutral remained comfortably low at 2% with those agreeing (37%) and strongly agreeing (58%) making a total of 95%. When people learn new skills, it is empowering and motivating, and this may result in higher performance due to high morale amongst the team members. Learning of new skills if they are appropriate for the tasks to be performed **(**Zamani, 2021:68-76**),** and the self-confidence amongst the team members and enables higher degrees of autonomy.

STATEMENT 28. Embrace changing behaviours of others

One of the definitions of a leader is that this is an individual that uses influence to change the behaviour of other people (followers) towards working to achieve a common goal (Latham, 2020:10-20). The employee must be able to see the benefit emanating from the change and possibly the type of relationship with the change manager. Leaders who adjust to change and the change in others tend to look ahead and identify opportunities they may seek to take advantage of (do Canto, Grunert and Dutra de Barcellos, 2023:20-40). Failure to see those changes and the benefits may make it difficult for the leaders to change, within the context of this study is the likely change because of the advent of AI and the necessary adjustment by leaders. It is inevitable that the workplace situation will alter as AI takes over and the type of employee to be managed will differ significantly to the current employee without much automation of operations (Onderick-Harvey, 2018). The practitioners' views are expressed in the diagram below.

Figure 5.31 Embracing of changing behaviours
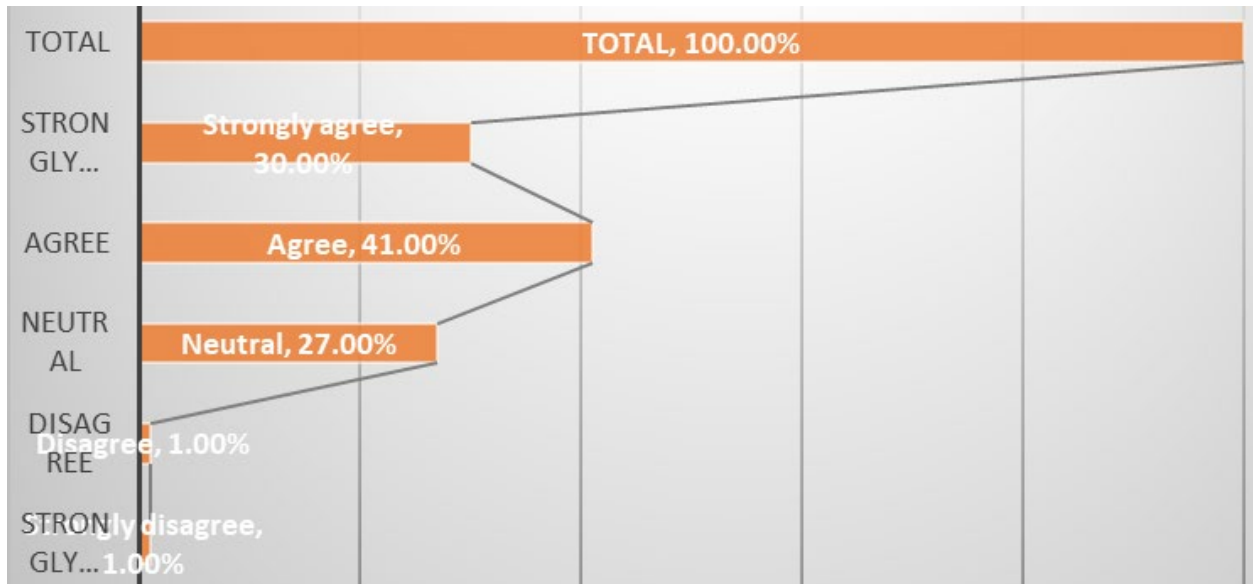
SOURCE: own construction

Neutral went up to an all-time high accounting for more than ¼ (27%) of the practitioners, this is unprecedented and is not clear why the sudden doubt. Those on the affirmative remain high however, accounting for 71% of the responses, just below ¾ of the respondents. This is the lowest score for those on the affirmative, but remains high enough to allow for justification or generalisation about the importance of embracing the changing behaviour of the others.

STATEMENT 29 Encourage changing attitudes and mindsets in teams

A mindset is an individual's established attitudes, perceptions, value systems and views about the world or specific phenomenon **(**Daspit, Fox and Findley, 2023:12-44**).** It is this mindset that influences the behaviour and the decision mechanism experienced or portrayed by an individual, based on the knowledge and experience **(**Kuratko, Fisher and Audretsch, 2021:1681-1691**).** The mindsets can be perceived as positive or negative, and some mindsets are easier to change than others, the effectiveness of a leader is based on their ability to manage in the mindset changes of the people the leader works. The respondents expressed their views as illustrated in figure 5.32

Figure 5.32 Managing mindset changes
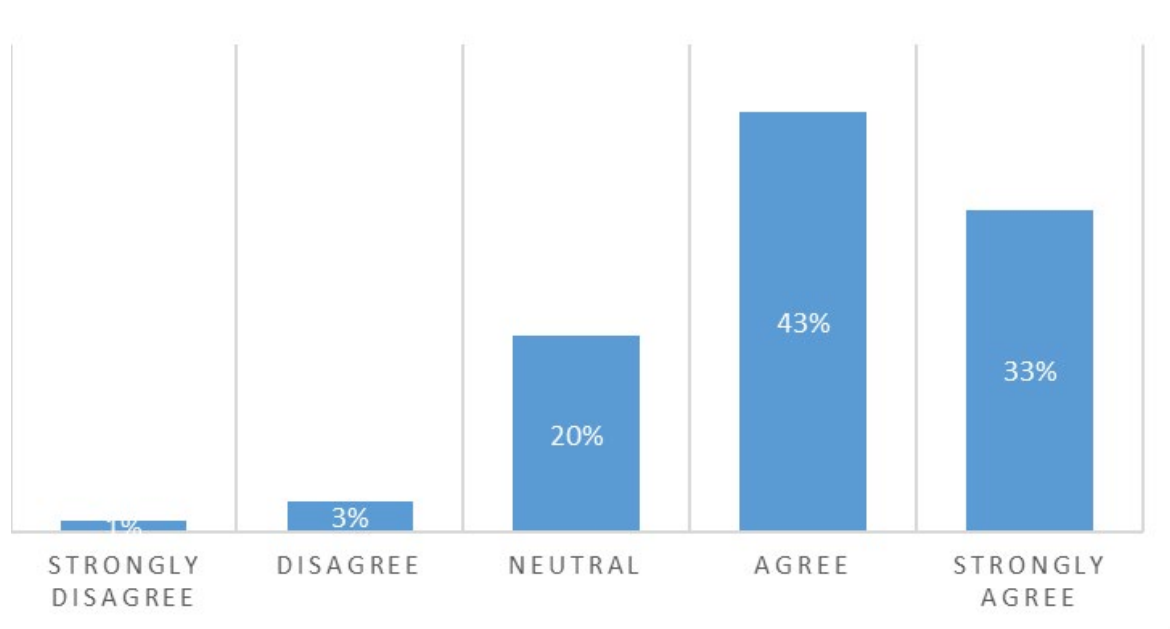
Neutral goes high again to 20%, but those in the affirmative (in agreement) stand at 43% and 33%, agreeing and strongly agreeing respectively making a total of 76%, just above ¾ of the respondents. Ozkan, Gök and Köse (2020:721-730) acknowledged the shifts in the minds of team members as well as the project leadership when new methodologies were applied. This was viewed as positive, specifically after training (upskilling and reskilling) had been provided, and the team members worked in a different environment.

STATEMENT 30. Ability to mentor others

Coaching and mentoring aim to help employees grow (within the workplace context) to enable them (employees) to reach their full potential and thus improve performance (Weinberg and Scandura, 2024:832-843). Generally provided by a trained individual (coaching) and or a senior individual imparting their knowledge and experience on a junior member. The primary purpose for these two systems or structures is to empower and facilitated for better performance by the recipients of the impartation of knowledge (Hussey and Campbell-Meier, 2021:510-521). The practitioners in their response to this shaded interesting aspects of their views, as illustrated in figure 5.33 below.

Figure 5.33 Coaching and mentoring as leadership
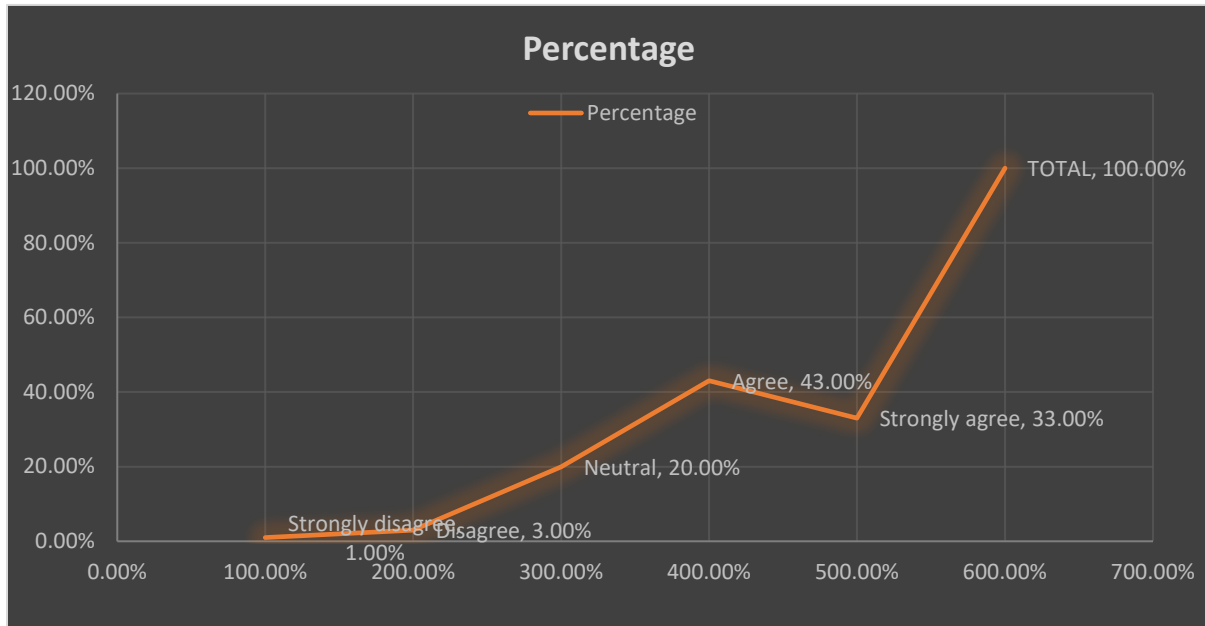
SOURCE: own construction

Neutral stands at 20% and continues to create questions in the researcher's mind because the respondents are experienced project practitioners who should have working knowledge on these matters. However, 43% agreed and 33% agreed strongly (total of 76%) thereby allowing for a generalisation, it can be concluded that coaching and mentoring are essential for team performance. Thompson (2019:4-15) posited that project managers develop better soft skills and self confidence through coaching and mentoring of subordinate team members.

SECTION C OPEN ENDED QUESTIONS

This section required (requested) that the respondents air their views on aspects that relate to the management or leadership in projects. Cognisance was given to the fact that these respondents worked on ICT projects on the main and that the use of online activities (non-personalised) leadership was increasingly a common phenomenon. Together with this was the environment in which many activities had not been transferred to execution through use of technology (tools, equipment, machinery, name it). Transiting from having

to do things in person to leaving the tasks to machines and being managed largely through online services should have required of them a drastic mindset shift.

REQUEST 1: State at least five (5) behaviours common amongst project leaders that you think should be looked at.

1	Leaders just give you the project charter and the project plan without explaining to you any other further details
2	They always expect that because they know what is to be done you should also know – have the same knowledge they have
3	You may never finish what you want to say before they start giving you an answer to an unfinished question
4	The general impression they give is that no one else has a view except if you are in agreement with what they think is right
5	Some of the grievances or concerns given to the project leaders are never heard of until you ask them to "please reply."
6	Leaders create the impression always that you are easily dispensable, this makes one to feel unimportant and unwanted in the team
7	There is nothing to say help us understand the purpose of our tasks and the importance of the undertaking to our performance
8	We are told about time limits but our work is not divided into specific targets to enable us to know what performance is good enough
9	No matter how well you perform, you are never acknowledged especially if you are not in the leader's good books

Treviño, den Nieuwenboer and Kish-Gephart (2024:129-161) assert that a positive behaviour as per definition by the team members encourages unity in the project team and will enable team members to be more resilient. This is also expected to work positively towards increased employee engagement which itself involved motivation to

perform as the synergy increases in the group. Safe to say, as stated by AL-Abrrow, Abdullah and Atshan (2019:072-985) that worker engagement increases the sense of ownership which assists with the much needed motivation to perform and an increase in job satisfaction. Regardless of the state and places where people work and how they do, human beings have views, perceptions, attitudes and name it, which must be central to any effective management of human resources.

REQUEST 2: State at least five (5) things you would do differently as a project leader in an organisation adopting Artificial Intelligence for their processes.

1	I would hold regular meetings (every 2 weeks) for all sub-teams and discuss the progress, the targets and other related matters
2	I would suggest that each sub-team must have weekly progress meetings which I may attend to keep myself updated
3	I would set out specific tasks (target) to be completed in specified time for every team member to enable me control
4	I will organise training sessions for all the team members who may have correctible weaknesses and promote skills development
5	I will expose all team members (specifically team leaders) to the Gantt chart and how it should be followed as per the schedules
6	The objectives, mission and vision of the project will discussed and rehearsed at all meetings to remind the team members
7	I will be accessible to all teams members and no formalism will be tolerated, so that anyone in the team can chat to me freely
8	I will emphasise the use of milestones as a measure of the project unit leader and the team member's performance gauge
9	I will try to be present regularly with the teams as a show of support but also to make team members realise the importance of the project.

The grand question making rounds is whether or not AI will be a threat to human leadership, but this is as much in the future such that current studies may need to be reviewed again. The extent to which AI will affect the human element is and can not be conclusively stated, after all it is intended to replace human intelligence (Titareva, 2021:1-12). With that as the objective of AI, there may be no logical reason to think that human leadership may not be affected, considering that the leaders will then have to reason (compete) with machines or technology (Xiong, 2022: 497-503). Some predictions however think that many aspects of the hard skills amongst leaders in the engineering sciences, after losing the cognitive processing of information, dominant in those disciplines, may lead to greater emphasis on soft skills. The change in the use of technology in the last 50 years plus has not helped to reduce the project execution failure rate standing at anything around 47% in engineering sciences (Peifer, Jeske, and Hille, 2022: 1024-1030). Another way of looking at it therefore would be that the human element remains the primary cause for project execution failure even though tasks take less time to perform because of technology. The human element and need for leadership contingent (Abedin, 2022: 425-453) to the circumstances may remain a critical element. The respondents continue to identify matters to do with the human element amidst the technology prevailing in the ICT industry.

REQUEST 3: State at least five (5) things you expect from your project leader in order to motivate performance of the teams.

1	I expect that the project leader should give the same number of tasks to all people at the same with the say wages
2	I expect my project leader not to show favouritism towards other team members because it is demotivating to other members
3	My leader should enforce completion of all tasks given equally to the subordinates and must reward people accordingly

4	There should be acknowledgement of innovation and good performance to motivate some people to perform for the team
5	Spending time with the team means the lazy people will try to work hard in the presence of the project leader, some people don't work
6	Identify poor performance, try to understand why, and discuss with team members to address the problem from roots
7	Provide regular training and upskilling so that people develop to higher levels and thus become empowered and more confident

Motivation is the driving force that makes an individual set out to do something, the process of deciding to act in a particular way and the eventual doing (Geen, 2019:522-541). It may be looked at as the persistent intention for an individual to achieve or accomplish certain goals or objectives regardless of obstacles and or difficulties. It is considered that there are three major components of motivation which are activation, persistence and intensity, all of which happen in the process of acting towards achievement of the aims (Wahyudi, 2022: 466-473). It is interesting to note that the action or behaviour of other people will either motivate or demotivate an individual, this therefore clarifies why leaders have an impact on team motivation. Touré-Tillery and Fishbach (2018123-134) posit that different people have different levels of motivation, and what motivates one individual may not always motivate the other, hence the leader needs emotional intelligence (EQ) to be able to discern what motivates and what does not. In an AI environment, this may be needed most considering the possible low levels of interaction between the leaders and the followers in the environment without much of human touch (Sarioglu and Ozmen, 2017:1-9). Emanating from the existing literature, there are specific actions that may be needed for a leader to effectively motivate a team to perform well. This are illustrated in table 5.1 below.

Table 5.1 Factors that motivate team members to perform

Set clear goals and share with team.	Give the team some autonomy
Allow for flexible work schedules	Encourage frequent communication.
Share your vision and set clear goals	Communicate with the team regularly
Encourage teamwork among them	Encourage a healthy environment ...
Give positive feedback and rewards	Be always accessible to members

SOURCE: own construction

REQUEST 4: State at least five (5) behaviours by project leaders that you appreciate and wish they were repeated by all project leaders.

1	Some project leader exercise patience and allow subordinates adequate time to learn and implement what they have been taught
2	Some leaders understand the situation and many times put themselves in the place of the individual with problems, just to help
3	Certain leaders balance between task focus and leader-team member relationship enabling the tasks to be performed
4	There is an effort by some leaders to sell or share the vision and thus providing the team members with better understanding
5	Certain leaders give autonomy to the teams to make decisions on matters that affect them, thereby giving them ownership of the results
6	Some leaders seem to know how to treat individuals within the context of their problems, circumstances and situations.
7	Other leaders realise the power of them being around (Management By Walking Around) and it creates the impression of importance

There is an apparent need for the understanding needed of the project leader about both the hard skills and as well as the soft skills (Aldulaimi, 2018:1-8). Hards skills speak to what and how it should be done, but soft skills make reference to who will do it and whether they do it well. The willingness (motivation) of the person performing the tasks remains supreme in that it is they that translate plans to deliverables, hence the importance of leadership to motivate performance (Abraham, Stewart and Solimeo, 2021:1-7).

REQUEST 5 State at least five (5) behaviours by project leaders that you think constitute poor project leadership

The common signs of poor project management are:

1.	Heading a demotivated project team without correcting causes for the low morale in the project team
2.	Focusing on the performance of individual team members instead of creating synergy and harmony in the team
3.	Poorly communicated project vision resulting in different understanding of project goals amongst team members
4.	Absence of shared vision within the project team resulting in low morale and team synergy leading to poor performance
5.	Poor monitoring and evaluation of project plans resulting in delayed tasks completion schedules and cost overruns
6.	Poor project team leadership during scope creep resulting in late completion of project, poor quality and cost overruns
7.	Lack of balancing of relationship and task focus to meet set milestones and have a motivated and performing team
8.	Poor communication of project charter, project plan, project milestones and management of the Gantt chart processes
9.	Poor stakeholder identification and engagement resulting in dysfunctional conflicts with both internal and external stakeholders
10.	Inability to integrate project activities from different WBSs and create combined and interdependent operations

11.	Failure to empower the project team members and allow them autonomy and thus reduce pressure on the leader having to micro-manage
12.	Failure to establish a SMART goals strategy with specific, measurable, attainable, relevant and time based objectives
13.	Failing to be accessible and or available to discuss team member problems and concerns as individuals and as teams
14.	Inability to provide correct amount of resources (human or material) in correct amounts at the appropriate levels

Many researchers have identified many leadership styles which were at certain times considered to be effective and acceptable. The general understanding after so many years is that leadership styles have relevant places where they apply, and they are not universal in nature **(**Zaccaro, Green, Dubrow and Kolze, 2018**)**. Emotional intelligence (EQ) has introduced another aspect on the ability to lead in projects, emphasizing the importance of a value judgement system as key to the ability to lead. Emotional intelligence refers to an individual's ability to manage one's own emotions and their relationships with the others (Deng, Gulseren, Isola, Grocutt and Turner, 2023:627-641). Emotionally intelligent people can motivate other individuals as they motivate themselves and are sensitive to the feelings of the people they deal with. EQ involves the ability to guide one's thinking and evaluation of situations and other people's emotions thus enabling them to lead effectively (Arora, 2017:43-45.**).** Poor leadership may therefore be considered as an individual's inability to understand other people's emotions and therefore not make good judgment. Poor leadership is bad for an organization, and it projects it contributes to the failure of project execution processes, thus the human element is critical in the execution of projects (Boddy, 2021: 67-81). Many projects have been cancelled because of poor execution, with organisations making loses and project companies failing to have business because of failed project execution processes. The advent of AI is not expected to make much difference to the current expectations for project execution going ahead (Judijanto, Asfahani and Krisnawati, 2022: 67-81) considering that the current levels of technology have not made any marked difference.

REQUEST 5: State at least five (5) issues you think will affect project execution if the Fourth Industrial Revolution (AI) comes full swing in the ICT projects practices

1	This may demotivate the team members who fear that they may be replaced by machines and will have no jobs after that.
2	This may cause labour unrest and work stoppage if it is not managed properly as unions will resist this type of action
3	The project leaders may suffer from the lack of learning to develop soft skills because machines do not talk and there's no need for soft skills
4	Companies may have to lay out large sums of money to acquire technology at the expense of the workers who worked all this time
5	Depending on the technology, the human touch and comradery that makes the workplace enjoyable may be lost
6	There will be fewer people to think and find solutions to the situation that the project execution processes need for efficiency.

The increased use of technology will inevitably remove more people from the task performance functions but will not eradicate the human presence as people still need to use and operate the machines (Huber and Alexy, 2024:108-136). The human element remains suggesting that leadership as a role for project execution remains critical for all practical purposes. The advancement may simply mean the need for extensive retraining of both the follower and the leader to fit into their new environment, obviously they will have to have new tasks and problems to think about (Peifer, Jeske and Hille, 2022: 1024-1030).

5.5 Summary of findings

5.5.1 Introduction

Leadership is arguably the most research field of study in human sciences considering that it is intricately involved with human life and activities. The success and failures of any human undertaking are always attributed to the failure or inadequacy in leadership in one form or the other. Safe to say that the studies on leadership do not seem to put too much into the role played by followers, inadvertently or not (Jowah, 2013:). Of primary importance in all the studies has been the context within which the research was conducted, but the common factor has always been the high project execution failure rate, even though there have been tremendous technological advances. Like other industrial revolutions, the Fourth Industrial Revolution (4IR), will inevitably bring the technological changes which will impact on the way things will be done, but the leadership element remains fundamental to the success of any projects. The research on contemporary thinking about the coming 4IR exposed a few things of particular interest.

5.5.2 Summary of findings

The objective for the study was primarily to understand what the technological advances and the coming in of the 4IR would impact on the execution of ICT projects with reference to leadership. Little change has taken place in the project execution success rate even with such advances in technology, specific emphasis is on ICT projects that have records of upto 62% project execution failure rate. Since the human element is the only constant as technological advances change the face of task operations, it is therefore deemed critical to study the single one factor that will make the difference in the execution of projects.

5.5.3 The research design and methodology

The descriptive research design was used because of its ability to describe the environment or the phenomenon understudy in which the leaders operate. This was used in conjunction with the mixed research methodology since descriptive research design is

compatible with simultaneous use of the methodologies. The use of both qualitative and quantitative methodologies, thus allowed for detailed description of the phenomenon, giving both breadth and depth. This allowed for a deeper understanding of what the project team members experience and what motivates or demotivates them to perform in their current environment. The targeted population was project practitioners (people working in the IT environment) who experienced these technological changes and the leadership issues.

5.6 Discussion of findings

The use of management by projects is increasingly used in industries of different disciplines even though the execution success rate is not always as expected (Kerzner, H. 2017). The use of management by projects is partly caused by the scarcity of resources and the expected efficiency in the use of the scarce resources for businesses. The advancement of technology and techniques is however commendable as it has introduced faster methodods of performing tasks. At the same time, Project Management as a profession and discipline continuously shows demand, and hence prompting the level of research in a discipline with high failure rates and yet highly demanded. The quest is therefore for the identification of competencies required for the effective execution of projects with a special focus on IT projects. The competencies required for the effective execution of the projects as indicated by the respondents are summarized below as indicated earlier in the chapter. Going into the future it remains that, as indicated by the study, specific things (competencies) will be required.

5.7 Limitations of the study

The study was carried out in the Gauteng Province which is only one of the nine provinces (though it is the commercial hub of the country) and may not necessarily represent correctly the other provinces. There is a need also to visit and include manufacturing organisations that are provided with the IT services to understand their situation, readiness and prospects as the AI will take over most of their operations.

5.8 Recommendations

It is recommended that future studies may identify IT organisations in all the provinces to allow for a broader understanding of the phenomenon. It may be necessary also to include academics in the IT discipline and some companies involved in manufacturing to get their views about the 4IR.

5.9 Conclusion

The increased use of technology will inevitably remove more people from the task performance functions, but the human presence is indispensable (Huber and Alexy, 2024:108-136). The human element remains, suggesting leadership continues has a role for project execution remains critical for all practical purposes. The advancement will necessitate extensive retraining of both the follower and the leader to fit into their new environment **(**Peifer, Jeske and Hille, 2022: 1024-1030**).** The use of management by projects is increasingly used in industries of different disciplines even though the execution success rate is not always as expected (Kunert and von der Weth, 2018: 47-66). The use of management by projects is partly caused by the scarcity of resources and the expected efficiency in the use of the scarce resources for businesses. The advancement of technology and techniques is however commendable as it has introduced faster methods of performing tasks (Bilir and Yafez, 2021:24-40). At the same time, Project Management as a profession and discipline continuously shows demand, and hence prompting the level of research in a discipline with high failure rates and yet highly demanded (Yohannes and Mauritsius, 2022:45-67). The quest is therefore for the identification of competencies required for the effective execution of projects with a special focus on IT projects. The competencies required for the effective execution of the projects as indicated by the respondents are summarized below as indicated earlier in the chapter. Going into the future it remains that, as indicated by the study, specific things (competencies) will be required.

Numerous factors have been identified to contribute to successful execution of project tasks and processes, chief amongst being the effectiveness of the project leader. The investigation in this paper clearly reveals that there are no fixed one-type-fits-all

behavioural patterns that will deliver the product without fail. The relevance of the competencies demands specific situations even though the principles may remain the same, the situation dictates what is most appropriate. Projects have different characteristics and tasks that call for different approaches and competencies, hence the shift in competency requirements for the project leaders. These changes in characteristics of the projects impact the competencies that are associated with leader behaviour, suggesting that leader effectiveness is based on the ability of the leader to mix competencies and skills as appropriately as possible. The study clearly shows that there are specific expectations from project leaders going into the future. The 10 PMBOK project management knowledge areas remain supreme and important as critical elements for any effective project execution programme. Critical among these is the need for high levels of emotional intelligence amongst the leaders (and the followers too) to be able to understand situations and emotions and allowed for collaboration. Execution of projects should be collaborative work integrated through the effectiveness of a leader, there is no specific leadership style, all leader-follower behaviours are contingent. In conclusion (summary) leaders must be good communicators, be relevant to the task and environment, learn to listen and be responsive, show high levels of integrity and ethical behaviour, must be people focused and seek to motivate individuals and build teams, build trust amongst the practitioners and be an example to the people they lead and apply leadership styles at appropriate times.

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